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MONEY AND CREDIT INSTRUMENTS

IN THEIR

RELATION TO GENERAL PRICES

BY

EDWIN WALTER KEMMERER

PRESENTED TO
THE FACULTY OF CORNELL UNIVERSITY
FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY
JUNE, 1903

REPRINTED FROM THE
CORNELL STUDIES IN HISTORY AND POLITICAL SCIENCE

NEW YORK
HENRY HOLT & CO.
1907

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PREFATORY NOTE

This monograph was begun in 1898 while the writer was an undergraduate student at Wesleyan University (Connecticut). In 1903 it was submitted in essentially its present form to the University Faculty of Cornell University as a partial fulfillment of the requirements for the degree of Doctor of Philosophy. It was revised for printing in December, 1905, while the writer was in the Philippine Islands, and, except for a few slight changes now made in the proof, is published as of that date. The writer wishes to acknowledge with gratitude valuable assistance received in its preparation from Willard Fisher of Wesleyan University, J. W. Jenks, Charles H. Hull, Frank A. Fetter, and Walter F. Willcox of Cornell University, and from H. H. Powers, formerly of that institution. Acknowledgment is also made to Mr. A. A. Giesecke of Cornell University for valuable assistance in the work of reading the proof.

E. W. K.

December 15, 1906.

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MONEY AND CREDIT INSTRUMENTS

IN

THEIR RELATION TO GENERAL PRICES

BOOK I

THE PROBLEM—THEORETICAL

CHAPTER I

INTRODUCTION

The recent controversy over the question of bi-metalism both in Europe and America has resulted in the denial of many old and generally accepted economic theories, prominent among which stands the so-called quantity theory of money. This theory,[1] held by Locke,[2] Hume,[3] and Adam

[1] For historical discussions of the theory of prices, see Zuckerkandl, *Theorie des Preises;* Laughlin, *Principles of Money,* chap. vii, and Willis, *History and Present Application of the Quantity Theory,* in *Journal of Political Economy,* IV. 417–448 (September, 1896).

[2] "The value of money, in general, is the quantity of all money in the world in proportion to all the trade; but the value of money in any one country, is the present quantity of the current money in that country, in proportion to the present trade." *Works,* V. 49.

[3] "It seems a maxim almost self-evident, that the prices of everything depend on the proportion between commodities and money, and that any considerable alteration in either has the same effect, either of heightening or lowering the price." Essay *On Money* in *Essays Moral, Political and Literary,* I. 316.

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Smith,[1] elaborated by Ricardo[2] and Mill,[3] and in recent years so ably defended in our own country by the late Francis A. Walker,[4] dates in a vague form as far back as the time of the Roman jurisconsult, Julius Paulus.[5] From the infancy of economic science to the present time it has been the most generally accepted theory of the value of money.

The differences between the supporters of the quantity theory and its opponents do not appear to be so much differences of absolute contradiction as differences in the relative importance attributed to certain factors entering into the determination of the general price level. One cannot read

[1] *Wealth of Nations,* I. 199–226, 288–296; II. 3–13. *Lectures on Justice, Police, Revenue and Arms,* 197–202.

[2] To Ricardo more than to any other economist belongs the credit for having given to the world the orthodox theory of the value of money. In his controversies with Malthus and with Bosanquet he gave one of the ablest expositions of monetary theory ever written. "That commodities would rise or fall in price, in proportion to the increase or diminution of money," said he, "I assume as a fact which is incontrovertible." *Reply to Bosanquet,* in *Works,* 326 note.

[3] "The value of money, other things being the same, varies inversely as its quantity; every increase of quantity lowering the value, and every diminution raising it, in a ratio exactly equivalent. This . . . is a property peculiar to money." . . . But, "In a state of commerce in which much credit is habitually given, general prices at any moment depend much more upon the state of credit than upon the quantity of money." *Principles of Political Economy,* II. 30, 53.

[4] "The quantity-theory of money is simply an expression, with reference to a special case, of the general law that value is determined in the relation between demand and supply. Prices being nothing more or less than values expressed in terms of money, those who hold the quantity-theory merely point out a specific instance for the application of a principle which has been established by competent induction, and the applicability of which is not challenged in any other instance within the view of the political economist." *Discussions in Economics and Statistics,* I. 211; also 193–236.

[5] Julius Paulus, writing near the beginning of the third century, refers to money (*nummus*) in these words: "Eaque materia forma publica percussa, usum dominiumque non tam ex substantia praebet, quam ex quantitate." *Pandects,* II. Book XVIII. 147.

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the recent controversial literature on the quantity theory without observing, on the one hand, that the theory often assumes very different forms in the minds of its various supporters, and, on the other, that the criticisms hurled at it by its opponents are, for the most part, aside of the mark, being aimed at such narrow or one-sided conceptions of the theory as no one at present would entertain. It may well be that if the opponents of the theory could be led to say precisely to what extent they are willing to admit that the quantity of money in circulation is influential in determining general prices; and if the adherents to the theory could be led to make a similar statement as to what they mean by the expression, "the quantity theory modified to suit new conditions," and by that other expression so pregnant with misunderstanding, *other things being equal*,[1] the differences between the two positions would not be so great as is generally supposed.

The problem before us is: Under our present day exchange economy, how are money and credit instruments related to general prices? This, it will be observed, is the problem which the quantity theory attempts to explain; and to its consideration we will proceed without further preliminary discussion.

Every commodity has a subjective price to the individual wanting it. In a money economy this price is the indi-

[1] "I hold that prices vary directly with the volume of currency, if other things are equal; but other things are constantly changing. This so-called 'quantity theory of the value of money' is true in just the same way as it is true that the day's temperature varies with the length of the day, other things being equal; but other things are seldom equal. This theory has been the cause of much controversy; but it has never been seriously denied by anyone who has taken it as a whole, and has not stopped short, omitting the words 'other things being equal.'" Alfred Marshall, testimony before the Indian Currency Committee. Cf. Indian Currency Committee of 1898, *Report, Minutes and Evidence*, Q. 11,759.

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vidual's subjective valuation of the commodity in terms of his subjective valuation of the money unit.[1] S for example offers his horse to B for $200. This price is purely subjective and does not of itself lead to an exchange, nor make any demand upon the circulating medium. It is only when B places a higher valuation upon the horse than he does upon $200 that an exchange takes place. Here an economic or objective price[2] emerges; it is the outcome of two subjective prices, each of which is a ratio between two subjective valuations. S's price is represented by his subjective valuation of the horse divided by his subjective exchange valuation[3] of the money unit; B's price is represented by his subjective valuation of the horse, divided by his subjective exchange valuation of the money unit. To quote Böhm-Bawerk:[4]

> . . . Thus, as a fact, in the whole course of the formation of price—so far as it is conducted on purely egoistic principles—there is not a single phase nor feature which is not traceable, wholly and entirely, to the position of subjective valuations as its cause.

[1] The word subjective value, and its derivative, subjective valuation, as used throughout this paper, refer to the quality or property of conditioning the gratification of want. The numerical importance of the subjective valuation placed upon any commodity depends upon the intensity of the want whose gratification is conditioned by that commodity. The subjective price of a given commodity to an individual is the number of money units which, through their purchasing power over other commodities, condition the gratification of want equal in intensity to that conditioned by the commodity in question.

The failure of many recent critics of the quantity theory to recognize the distinction between subjective and objective prices has been a source of much misunderstanding.

[2] That is, the value of the money unit to him as determined by its purchasing power over other commodities, whose objective prices are continually being fixed in the same manner, and are more or less definitely known to S as to the rest of the public.

[4] *Positive Theory of Capital*, 210.

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If prices depend upon subjective valuations, the question at once arises, upon whose subjective valuations does the price of a given commodity depend? To answer this question and to illustrate the principle of price determination as it applies in a market where a number of buyers and sellers come together, let us take with some modifications the well-known illustration of Böhm-Bawerk,[1] adapting it along the lines suggested by Hobson.[2]

Assume[3] an open market where horses are bought and sold, assume "that all the competitors appear simultaneously," that all the horses offered for sale are of the same quality, and finally, "that the buyers and sellers make no mistake about the actual state of the market, such as would prevent them from really pursuing their own egoistic interests." In the diagram on page 6 designate the prospective sellers by the symbols, S^1, S^2, S^3, etc., and the prospective buyers by the symbols B^1, B^2, B^3, etc.; designate their respective price limits[4] by the distances from the base line A—B of the points S_1, S_2, S_3, etc., and B_1, B_2, B_3, etc. The numerical amounts of the respective subjective prices are given in the figures accompanying the corresponding symbols. If the price asked by the sellers is \$107.50 (S_6) or above, there will be more sellers than buyers and competition among the sellers will force the price down; if the price offered by the buyers is \$105 (B_6), or below, there will be more buyers than sellers and competition among the buyers will force the price

[1] Böhm-Bawerk, 203, 304.

[2] *The Economics of Distribution*, 11–14.

[3] The remainder of this chapter is a summary of an article by the writer on *The Higgling of the Market* in *Quarterly Journal of Economics*, XVII. 670–677 (August, 1903).

[4] The price limit of each buyer in the illustration is the highest price he would be willing to pay rather than be deprived of a horse, the price limit of each seller is the lowest price he would be willing to accept rather than not make a sale.

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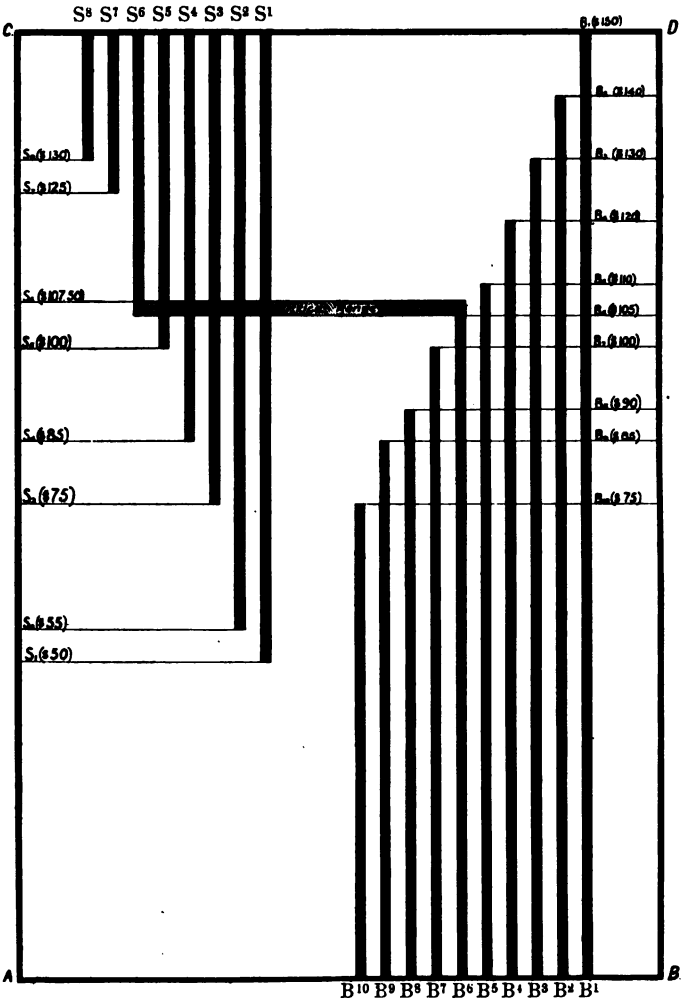

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up. The price must therefore be fixed somewhere between $107.50, the price limit of the lowest excluded seller, and $105, the price limit of the highest excluded buyer; for it is only within those limits that the number of sellers and the number of buyers will be equal.

The forces which determine the precise point within the "price-range" at which the price will be fixed, are similar to those which determine the range itself; the only difference being that the determining utilities and disutilities in the case of the price-range are represented by the money and the horses; while the utilities and disutilities which fix the price within the price-range are those incident to the bargaining process itself. The price-range is therefore the range of which the upper limit is the subjective price of the lowest excluded seller, and the lower limit is the subjective price of the highest excluded buyer; and the market price is fixed at that point within this range at which both buyers and sellers consider the actual and probable disutilities connected with further bargaining to offset the certain and probable gains to be obtained by such bargaining.[1]

From the foregoing explanation it will be seen that the economic price of any commodity is the subjective valuation placed upon that commodity, divided by the subjective exchange valuation placed upon the money unit; these price-determining subjective valuations being the valuation of the commodity and the valuation of money agreed upon by buyers and sellers as the result of a competitive process of the character above described. Every change in taste, and every alteration in the supply of commodities will cause the

[1] This is the law of price expressed in its simplest form, and as it applies in a market of the character above described. It is perhaps needless to say that the conditions of exchange are quite different in every day life. A thousand modifying circumstances must be taken into account, but under them all this fundamental law is at work, and for our purposes a statement of the underlying principle is sufficient.

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subjective valuations of buyers and sellers to vary. The number of buyers, the number of sellers, their respective price limits and the economic prices which they determine are all continually changing.

Without denying for a moment the extreme importance of the forces affecting the commodity side of the price ratio, we must pass that subject over with a mere reference to the old Latin adage: *de gustibus non disputandum est.* The subject of this monograph is the relation of money and credit instruments to general prices, and the discussion will be restricted as closely as possible to a consideration of the principles which determine the value of money *per se.*

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CHAPTER II

MONEY AND PRICES IN A HYPOTHETICAL SOCIETY

Now that the way has been cleared by a brief statement of the law underlying the determination of individual prices, we may proceed to the central problem, that is, the relation existing between the circulating media and general prices.[1]

In view of the extreme complexity of the problem, resort will be had to the usual method of first discussing the relation between the quantity of money and prices as it would exist in a simple hypothetical society in which the sole medium of exchange was money, and then upon this as a foundation, of gradually building up our modern exchange system, modifying the conclusions based upon the simple hypothetical society, as it may become necessary, to suit new conditions. Finally, an endeavor will be made to test the conclusions so reached by a statistical study of industrial conditions in the United States for the period from 1879 to the present time.

This method of procedure has repeatedly been criticized by writers on money.[2] The criticism is generally essentially as follows: that such an hypothetical society could not exist among human beings, that the assumption that factor after

[1] It is to be observed that "general prices" are but a combination, or composite photograph, as it were, of individual prices. Nicholson refers to the term as "but an expression for the sum total of an infinite series of particular prices." *A Treatise on Money, and Essays on Monetary Problems*, 350.

[2] Cf. for examples, Foville, *La Théorie Quantitative et les Prix*, in *L'Économiste Français*, XXIV. 451, 452 (April 11, 1896), and Conant, *What Determines the Value of Money?* in *Quar. Jour. Econ.*, XVIII. 552, 553 (August, 1904).

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factor can be added separately is contrary to reality, and that the postulate, "other things being equal," made when new factors are being added, is one impossible to realize, since in the very nature of the case, each new factor carries with it a multitude of others from which it cannot be logically separated. These claims, it is believed, may be freely admitted without impairing the admissibility of the method. In economics experiment is impossible, the phenomena are too complex, too vast, and too closely related to human welfare to permit the investigator to manipulate them at his will. In the field of natural science, especially in physics and chemistry, complex phenomena can be simplified by actual manipulation, confusing factors can be removed, the elements in the problem to be investigated can generally be arranged in a variety of desired combinations, and the different results noted. But even in the most exact of the experimental sciences, hypotheses which can never be realized are made every day as the basis of reasoning. In nearly every scientific investigation confusing factors exist which cannot be removed and which must be allowed for by mental abstractions.[1] If such assumptions are necessary in the natural sciences, where experiments are so easy, are they inadmissable in a field like economics where experiment is all but impossible? Provided it is never forgotten that the hypothetical conditions are purely imaginary, that allowance is made for each of the added factors separately and in their subse-

[1] Take for example the theory of projectiles in physics. A common procedure is, first to describe the path of a projectile projected with a given force into a perfect vacuum, then of one projected with the same force into an atmosphere absolutely uniform throughout, then into an atmosphere varying in density at a perfectly uniform rate, and finally, into atmospheres of the kinds actually realizable. Now the first three conditions, as everyone knows, can never be perfectly realized, and yet the physical theory of projectiles has obtained an almost absolute degree of accuracy.

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quent combinations, and provided further that all elements in the problem likely to influence the result are ultimately taken into account, this method of procedure appears not only legitimate, but highly desirable. It is finally and decisively the only method possible if the present problem is to be worked out.

Let us assume, then, a society of persons completely isolated from the rest of the world,[1] possessing considerable wealth and a well developed system of exchange; assume, moreover, that neither barter nor credit is known, that in every transaction the actual money passes from the buyer to the seller, and that each member of the society buys or sells whenever he can make a profit thereby, and always so acts as to obtain the largest profit possible. Assume that there are ten thousand units of money in circulation, consisting of ten thousand coins, all of them being alike. Assume that these coins are issued solely by the government, and are made of a material formerly possessing a high commodity value, which of late has entirely disappeared, but that the coins still continue to circulate, through the influence of custom, and by reason of the demand for a medium of exchange.

Each member of such a community would in a more or less definite and conscious way place subjective valuations upon the various commodities known to him, and upon the units of money constituting the medium of exchange.[2] These valuations would be individual matters, but in all cases would tend to vary with the supply of the particular

[1] In the preparation of the remainder of this chapter I have found especially helpful the following discussions: Newcomb, *Principles of Political Economy*, book iv, Nicholson, *Principles of Political Economy*, II. 118 et seqq., Fisher, *The Rôle of Capital in Economic Theory*, in *Economic Journal*, VII. 516 et seqq. (December, 1897), Walras, *Théorie de la Monnaie*, chap. iii, Norton, *Statistical Studies in the New York Money Market*, chap. i.

[2] Supra, 3–7.

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commodity and the supply of money in accordance with the familiar law of diminishing utility. Out of the mass of more or less definite subjective prices thus arising, let us suppose that a number of prices should appear at which an advantage to both buyer and seller would result from an exchange. An exchange in each such case would *ex hypothesei* take place, and in the exchange processes themselves economic or objective prices would emerge. It is important to note that an economic price cannot exist, in a purely egoistic society, independently of an exchange operation,[1] for (to paraphrase a homely adage) "the proof of the price is in the selling of the horse."[2]

[1] It is a common observation that stock quotations to be of value must show the number of sales effected at the prices quoted. A stock for which the maximum bids were 100 and the minimum offers were 115 would not possess an economic price. If there were a thousand shares of a given stock on the market, and the subjective prices of buyers and sellers were such that there would be a mutual gain in subjective values in the exchange of 100 shares; and if further exchanges would result in losses in subjective values, then 100 shares would be sold, and in the exchange process an economic price (or economic prices) would emerge for 100 shares. The remaining 900 shares would have no economic price, and no one could tell with certainty at what price or prices additional shares would ultimately be sold. A virtual deadlock might continue indefinitely, meanwhile published quotations of the stock would be "merely nominal." The fact that sales have recently been effected at a certain price, or are now being so effected, is of course presumptive evidence that intending purchasers can buy at that price. An economic price, however, is the amount of money paid for a commodity; not the amount asked, offered, or promised.

[2] If the principle here laid down is true, the fallacy of the criticism of the quantity theory expressed in the following words of Laughlin, is evident: "The offer of a certain amount of some media of exchange for goods merely records the antecedent price-making process. The media of exchange come into play after the price-making process, and not as a part of that process. In the main, the media of exchange are a consequence, not a cause, of the influences determining prices." *A Theory of Prices,* in *Publications of the American Economic Association,* third series, VI. No. 1, 73 (February, 1905). Laughlin here, as in his *Principles of Money,* confuses subjective and objective or economic prices.

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If the above statement is true, it is little more than a truism to say that in a society of the kind we have assumed every exchange would involve the transfer from the buyer to the seller of the amount of money represented by the price. If one thousand commodities were exchanged and the price of each was ten units, and if each unit of money changed hands but once, then ten thousand units of money would be required to effect the exchanges; if each unit of money changed hands ten times instead of once, one thousand units of money would be sufficient to perform the same amount of work. If, on the other hand, instead of there being one thousand commodities to be exchanged, there were only one hundred, but if each of the one hundred commodities changed hands ten times, the demand upon the circulating medium would be unchanged.

If we represent the quantity of money in circulation by M, the number of times it is turned over by R, the number of commodities exchanged by N, the number of times they are exchanged by E, and their price by P, it is evident that:

$$(1)\ MR = NEP;\ \text{or}\ (2)\ P = \frac{MR}{NE}$$

In the above formula MR represents the monetary supply, NE the commodity supply, and NEP the monetary demand. The formula will be recognized as an algebraic expression of the quantity theory.

In the formation of our hypothetical society it was assumed, for the sake of simplicity, that all the pieces of money were alike, that each had the same rate of turnover, that all the economic prices which emerged from the mass of subjective prices happened to be the same, and that the commodities all changed hands the same number of times. A moment's consideration will show that the truth of the above formula, in a society otherwise complying with the conditions

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laid down, is not dependent upon any one of these assumptions. Suppose that the money supply, instead of consisting of coins all exactly alike, were composed of coins representing a number of different denominations, and that each denomination had a rate of turnover peculiar to itself. Under those circumstances the money work done by the coins of each denomination would be represented by the number of money units of that denomination multiplied by their average rapidity of circulation,[1] and the work of the total coins of all denominations would be represented by the total number of money units (M) multiplied by their average rapidity of circulation. The same principle would apply to the commodity side of the price ratio. It is evident that the exchange of a commodity whose price was ten units would represent five times as great a demand upon the circulating medium as the exchange of a commodity whose price was two units. The expression "general prices" as here used represents a simple average of individual prices, and it is immaterial, so far as the demand for money is concerned, whether the individual prices upon which the average is based are all the same or all different.[2] In other words,

[1] "The phase, rapidity of circulation . . . must not be understood to mean the number of purchases made by each piece of money in a given time. . . . The essential point is, not how often the same money changes hands in a given time, but how often it changes hands in order to perform a given amount of traffic. . . . Some such expression as 'the efficiency of money,' though not unexceptionable, would do better; as it would point attention to the quantity of work done, without suggesting the idea of estimating it by time." Mill, II. 32. Cf. Kinley, *Money, a Study of the Theory of the Medium of Exchange*, 151–154.

[2] Suppose that instead of there being only one denomination of money there are 10 denominations, and instead of there being only one kind of commodity there are ten kinds, suppose further that each denomination of money and each variety of commodities has a rapidity of turnover peculiar to itself. If we designate the different denominations of money by the symbols M_1, M_2, M_3, etc., their respective rapidities of circulation by R_1, R_2, R_3, etc., the number of commodities of each variety to be

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in such a community the average economic price of commodities is equivalent to the total amount of money into its average rate of turnover, divided by the total number of commodities into the average number of times they change hands.

If in such a society the money supply should be increased, the number of commodities and their rate of turnover remaining unchanged, it is evident that the subjective valuations placed upon a unit of money, by the various members of the community into whose hands the new supply found its way, would decline; their subjective prices would rise in accordance with the law of diminishing utility, and higher economic prices would emerge. The opposite result would follow if the monetary supply should be reduced, under like conditions. If, on the other hand, the supply of commodities should be increased, the monetary supply remaining un-

exchanged by N_1, N_2, N_3, etc., and their respective number of exchanges by E_1, E_2, E_3, etc., the price formula will read:

$$(3)\quad P = \frac{M_1R_1 + M_2R_2 + M_3R_3 + \ldots\ldots\ldots M_{10}R_{10}}{N_1E_1 + N_2E_2 + N_3E_3 + \ldots\ldots\ldots N_{10}E_{10}}$$

If we designate the total money of all kinds by M, its average rapidity of circulation by R, the total commodities of all kinds by N, and the average number of times they change hands by E, then

$$(4)\quad R = \frac{M_1R_1 + M_2R_2 + M_3R_3 + \ldots\ldots\ldots M_{10}R_{10}}{M}$$

and

$$(5)\quad MR = M_1R_1 + M_2R_2 + M_3R_3 + \ldots\ldots\ldots M_{10}R_{10}$$

$$(6)\quad E = \frac{N_1E_1 + N_2E_2 + N_3E_3 + \ldots\ldots\ldots N_{10}E_{10}}{N}$$

and

$$(7)\quad NE = N_1E_1 + N_2E_2 + N_3E_3 + \ldots\ldots\ldots N_{10}E_{10},$$

Placing MR in place of its equivalent, the numerator of the fraction in formula (3), and NE in place of its equivalent, the denominator, we have

$$(2)\quad P = \frac{MR}{NE}$$

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changed, the subjective valuations placed upon the various commodities whose supply was increased would decline; their subjective prices would fall in accordance with the law of diminishing utility, and lower economic prices would emerge. The process would be reversed, were the supply of commodities to be diminished under like conditions. Alterations in the monetary supply (MR) and alterations in the commodity supply (NE) affect the general economic price level only through their influence upon individual subjective prices and subjective valuations;[1] but throughout the entire process of price making, in a society of the type here assumed, the relation between the various factors can be expressed by the formula[2] of the quantity theory,[3] $P = \frac{MR}{NE}$.

[1] From what has been said with reference to the price-making process, it should be evident that the quantity theory does not involve any such absurd method of reasoning as the following criticism of Laughlin attributes to it: "It is true that some writers have argued as if the level of prices were arrived at by first finding out the amount of exchanging to be done . . . and then comparing with that the quantity of the media of exchange actually offered against goods. . . . If it were done, then individual prices would be a result of working from this abstract level of prices to single prices so adjusted that the latter would together equal the general price level. . . . That is a method which may be claimed logically to follow from the quantity theory." And again "The insufficiency of the quantity theory, when applied to international trade, is too apparent to need statement; yet one may doubt if it is any more absurd to try to compare the mass of goods with the media of exchange in international trade in order to determine their prices, than it is to apply that method of price-making to goods and the media of exchange within a country." *Principles,* 352, 353, 367.

Kinley's method of determining the value of the money unit by dividing the value to the community of the generic thing, a medium of exchange, by the number of money units, (*Money,* 130) seems analogous to finding the value of a loaf of bread by dividing the value to a community of food by the number of loaves of bread it possesses.

[2] In other words, alterations in the monetary supply (MR), the commodity supply (NE) remaining unchanged, are accompanied by propor-

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tionate changes in general prices (P); and alterations in the commodity supply, the monetary supply remaining unchanged, are accompanied by inversely proportionate changes in general prices.

[3] The point discussed by Hildebrand in his *Theorie des Geldes*, chapter II, is perhaps worth noting here, that the amount of money needed by a community depends not only upon the general level of prices, the number of commodities to be exchanged, their average rapidity of exchange, and the average rapidity of monetary turnover, but also upon the extent to which the exchanges are bunched or scattered. The argument is essentially this: Two communities may have the same price level, the same number of transactions within a year's time, and the same average rapidity of monetary turnover; yet the amount of money required by one community may be much greater than the amount required by the other, because in the former—say, for example, an agricultural community—the demand may be bunched at certain times for the moving of the crops, while in the latter—say, for example, a manufacturing community—it may be relatively uniform throughout the year. Unless the currency in the former community is so elastic as readily to increase or decrease with the demands of trade, it will be necessary for the community to maintain for a considerable part of the time an amount of money nearly sufficient to meet the year's maximum demand.

The fact that the one community may require more money than the other to effect the same amount of money work (NEP), by reason of the bunching of that work in certain periods in the former community and not in the latter, is not in the least contradictory to the quantity theory as expressed in the formula $P=\frac{MR}{NE}$. It is to be noted that under such circumstances the money turns over less times in the agricultural community in effecting the same amount of exchange work than it does in the manufacturing community. The degree to which transactions are bunched or scattered is a consideration relating particularly to the element of time, while the quantity theory is a comparison of the money supply and the money work to be done irrespective of the time required for its performance. Supra, 14 note.

In the agricultural community above referred to, it may be true that more money will be required in certain seasons of the year than in the manufacturing community. If, however, P, N and E are the same for both communities, either the larger volume of money in circulation during the busy season in the agricultural community is offset by a proportionately decreased volume during the light season, so that the average volume for the year is the same as it is in the manufacturing community; or the extra volume of money required for the busy season,

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lies idle during the light season, and the average rapidity of monetary circulation (R) is decreased. In other words, the value of MR in the two communities may be the same, but in the agricultural community the bunching of the trade may render M a relatively greater factor, and R a proportionately less factor in the expression MR than in the manufacturing community. If P, N, E and R, respectively, are the same in both communities, M must be the same. Cf. infra, 56–59.

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CHAPTER III

SOME OBJECTIONS CONSIDERED

While many critics of the quantity theory are willing to admit the applicability of that theory to a simple society of the character so far assumed, there are a few who believe that the theory is fundamentally unsound, and who deny its applicability even to such a society.[1] It will be well, therefore, to consider their objections[2] at some length, before we approach, in the progress of our discussion, more nearly to actual industrial conditions.

We began by assuming that in our hypothetical society all the money was in circulation, and that all the pieces exchanged hands the same number of times. Later we modified this assumption by assuming that the coins of each denomination had a rate of circulation peculiar to themselves. In this connection one more fact remains to be added. In actual industrial society considerable sums of money are often withdrawn entirely from circulation for long periods of time. The subjective valuations placed upon such money by its possessors are not such as to make it profitable for them to part with it. One important function of money is that of a storehouse of value. Money can always be disposed of for goods; it possesses to a preëminent degree the quality which Menger calls "saleability" (Absatzfähigkeit).[3] Moreover, in a society possessing a well ordered monetary system, money is generally, of all commodities, the least likely to deteriorate in value during short periods

[1] Cf. Laughlin, *Principles*, 247–251, Scott, *Money and Banking*, 57–61.

[2] Cf. supra, 12 note 2, and 16 note 1.

[3] *Grundsätze der Volkswirthschaftslehre*, 233 et seqq.

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of time. This being true, large sums of money are continually being hoarded. The possessor of money compares the utilities he can get for the money by disposing of it to-day with those he believes he can get for it in the future, and if the highest present utility is not so great as the highest future utility discounted for risk and time, the money is hoarded. This is the condition of all hoarding.[1]

Two facts regarding hoarding have an important bearing upon our subject: (1) Money thus hoarded is not exchanged for commodities; (2) the proportion of the circulating medium which is hoarded from time to time in any country is not constant; on the contrary, it varies with all the influences which affect that most intangible and volatile, yet influential something, which we call *business confidence*.[2] If, within the period of time taken as a unit, part of the money of a community is not exchanged for commodities, and if, further, the proportion of the whole represented by this part is extremely variable, it may well be asked what becomes of the quantity theory of money, which declares that, other things being equal, a proportionate relation exists between the quantity of money and prices. This objection to the quantity theory has repeatedly been made. Giffen, for example, after referring at some length to the great amounts of money which are continually being hoarded, says: "The hoards themselves are not money in circulation in any form, and the demand to replenish them is not a demand for 'money,' and the supply of these demands is not a supply of 'money,' which can help to make any such relation between the quantity of money, and prices as the quantitative

[1] If Jevons's assertion were true that "it is an essential characteristic of coin that it yields no profit by keeping it in the pocket or the safe," hoarding would be, economically speaking, an impossibility. *Money and the Mechanism of Exchange*, 245.

[2] Cf. infra, 145.

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theory of money, and with it the bi-metallic theory, assume."[1]

The usual answer to the above criticism, on the part of adherents to the quantity theory, is the statement that hoarded money is not money in any proper sense of that term, and that only that money which is in actual circulation is referred to under the term *money* in statements of the quantity theory. Locke said with reference to hoarded money, "that which is not loose into trade, is all one, whilst hoarded up, as if it were not in being."[2] Hume, speaking of the same subject, said: "It is the proportion between the circulating money, and the commodities in the market, which determines the prices;"[3] and again, "If the coin be locked up in chests, it is the same thing with regard to prices, as if it were annihilated; if the commodities be hoarded in magazines and granaries, a like effect follows. As the money and commodities, in these cases, never meet, they cannot affect each other."[4] This is the position taken by other early as well as recent adherents to the quantity theory. Mill went so far as to say that, "The money in the coffers of the bank, or retained as a reserve by private bankers, does not act on prices until drawn out, nor even then unless drawn out to be expended in commodities."[5] This interpretation of hoarded money would seem to be simple and reasonable in cases like the great war hoards of Europe, where large sums of money are withdrawn from trade channels for long periods of time.

War hoards, however, are rapidly becoming things of the past. In countries like England and the United States they are unknown. Hoards at the present day are generally of

[1] *A Problem in Money* in *The Nineteenth Century*, XXVI. 866 (November, 1899).

[2] *Works*, V. 74.

[3] *Essays*, I. 318.

[4] Ib. 316, 317.

[5] *Principles*, II. 34.

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small amounts, held during relatively short periods of time, and, except during periods of commercial depression, are of little importance and require no special treatment. The word hoarding, it is important to note, is a relative term. An anonymous writer some years ago explained the nature of hoarding correctly when he said:[1]

> . . . A difference in the degree of the rapidity of the circulation of money, is only a difference in the number and length of the hoardings which may intervene between one use of it in purchasing, and the next succeeding same use of it. The rapidity of the movement of money is not in the nature of the rapidity of a horse or a locomotive, but signifies merely the number of times it is used in purchasing within any given period.

Hoarded money performs the money function of a storehouse of value, creates a demand for the money metal, is popularly known as money, and should properly be considered as money having a zero rate of turnover during the time it is hoarded. The money supply (MR) is represented by the amount of money multiplied by its average rate of turnover, and the commodity supply (NE) is represented by the number of commodities multiplied by their average rate of turnover. Money therefore which is hoarded, and whose rate of turnover is zero, and likewise commodities which are not exchanged, have no numerical importance whatever in the price formula[2] $P = \frac{MR}{NE}$. Nevertheless the subjec-

[1] *The Value of Money is Controlled by its Quantity*, in *Banker's Magazine* (New York), XXXV. 863, 864 (May, 1881). Cf. supra, 14 notes.

[2] If, for example, in formula numbered 3 (page 15 note) the hoarded money be represented by M_{10}, and its rate of turnover by R_{10}, then R_{10} being zero, $M_{10}R_{10}$ would cancel out; if all commodities not exchanged were represented by N_{10}, and their rate of exchange by E_{10}, then E_{10} being zero, $N_{10}E_{10}$ would cancel out. In either case the validity of the formula would in no wise be affected.

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tive valuations placed upon them may have been indirectly of extreme influence upon the price level, through their influence upon R and E in the process of price determination.[1]

This explanation of the nature of hoarding will show the fallacy of the criticism recently made by Conant[2] upon the quantity theory as expounded by Walras:

> . . . "He admits," says Conant, "that 'from one moment to another all the elements of the problem are modified,' but maintains that at a given moment, other things being equal, if the quantity of money increases or diminishes, prices will rise or fall in proportion. . . . But throughout his reasoning the fact appears to be ignored that all the new money is not at once offered against all the goods offered in exchange for money."

To this criticism it may be replied that it makes no difference to the truth of the quantity theory whether the new money is offered for commodities all at once, slowly, or not at all. The supply of the new money, as well as of the old money, is always to be interpreted in terms of its rate of circulation. The introduction of new money which does not circulate increases the number of money units, but reduces the average rate of monetary turnover in the same proportion; it increases M and reduces R, but leaves the value of the expression MR unaltered.

Another frequent objection to the applicability of the quantity theory to a régime of the type here assumed, is found in the existence of barter. Barter, or the direct exchange of goods without the intermediation of money, is by no means obsolete. On the continents of Asia, Africa, South America and Australia, it is a method in common use to this day. Nor can the people of Europe and America claim

[1] Cf. supra, 4–7, 11–16.

[2] *What Determines the Value of Money?* in *Quar. Jour. Econ.*, XVIII. 553 note (August, 1904).

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that it is unknown among them. To quote the words of the late Francis A. Walker:[1]

. . . In agriculture, the world over, full payment in money is highly exceptional where it is not wholly unknown. In England the money wages in general far exceed the estimated value of all the other forms of payment, and rarely constitute less than one-half the nominal wages. In Scotland, except in the neighborhood of large towns, payment in kind is very general, while 'in some parts of the highlands little money passes at all between employer and employed.' In Germany the report of the recent Commission of the Agricultural Congress proves the custom of payment in kind to prevail in every province from East Prussia to Alsace. In France this custom prevails to a greater or less extent in nearly all departments. In the United States board to the unmarried laborer is perhaps the rule; while in the South, at least, the payment in kind generally includes the subsistence of the laborer and his family, and, to a considerable extent, other necessaries of life.

Among other examples of barter which may be cited are the renting of farms on shares, a large part of the business of the so-called company-store, the balancing of accounts by merchants, and the working out of taxes as for example the corvee in Java, and the working out of road taxes in the United States. Transactions of the above kinds do not involve a money price; they make no demand upon the circulating medium, and it is evident that they are not included in the price formula $P=\frac{MR}{NE}$. It must not be thought, however, that economic prices are not influenced by variations in the extent to which exchanges are effected by barter. The process of evaluating commodities which results in their being bartered for each other is essentially the same as

[1] *The Wages Question*, 19, 20; cf. Walker, *Money*, 64, 197–204, 279; Hammond, *The Cotton Industry*, I. chap. v.

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that previously described[1] which leads to the exchange of commodities for money. The exchange of goods by means of barter represents a demand for goods just as truly as does their exchange by means of money. Such exchanges affect the subjective valuations placed upon goods by the various members of the community; and the varying extent to which barter is resorted to affects the demand for money and the subjective valuations placed upon money by the people of the community. The demand for a given article of merchandise in a country store is no less real if that article is bartered for eggs than if it is sold for money. Increase the extent to which exchanges are effected by means of barter in a given community, and the supply of money relative to the demand will increase, lower subjective valuations will be placed upon the money unit, and a higher level of economic prices will result. This alteration in the price level, however, it is to be noted, would be effected in a manner perfectly in harmony with the principle of the quantity theory as stated in the formula $P = \frac{MR}{NE}$; for the changed subjective valuations above referred to would affect P through their influence upon E and R of the formula.

Other transfers of money or of commodities in which no economic price emerges, such, for example, as gifts and bequests, are not included in the exchanges (MR and NE) contemplated by the quantity theory; although, like barter, they may affect MR and NE and thereby affect P, through their influence upon subjective valuations and subjective prices.[2]

Before proceeding further in our discussion it will be well, in order to avoid confusion, to consider for a moment

[1] Supra, 4–7, 11–16.

[2] Cf. infra 75 note 3.

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the meaning of the term money.[1] It is not our purpose to undertake a detailed discussion of the mooted question as to what should be called money, but simply to define that term as it is used throughout this paper, and to state briefly the grounds for such use.

Definitions and classifications have too often been treated by scientists as ends in themselves instead of merely as means or instruments to facilitate the discovery and promulgation of scientific truth. In no field probably has this error been more frequent than in that of monetary science.

A definition, in order to serve its purpose effectively, must be based upon pertinent characteristics, must be sufficiently comprehensive to embrace all objects possessing those characteristics, and sufficiently precise to exclude all objects not possessing them, regardless of how similar the excluded objects may be in other respects. If the classification is one of animals, and the subject under consideration is that of the character of the food they consume, then, however unlike the animals may be in other respects, the herbivorous will be placed in one class, the carnivorous in another, and the omnivorous in a third; and a definition of either class will be based primarily upon the criterion pertinent to the purpose in view, that is, the character of the food it eats. This principle applies equally to the classification of the media of exchange. Such media may be classified on any number of different bases, according to the purpose in view; they may be classified, for example, with reference to the material of which they are made, with reference to the institution by which they are issued, or with reference to the machinery by which their value is sustained. But for our present purpose the pertinent characteristic of a medium of exchange is rather to be found in the manner in which it serves as an

[1] Cf. Walker, *Money in its Relations to Trade and Industry*, 4–27, and Andrew, *What Ought to be Called Money*, in *Quar. Jour. Econ.*, XIII. 219–227 (January, 1899).

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instrument for the exchange of commodities. Although every exchange of one commodity for another involves, in a manner, the measurement of the value of the one commodity by that of the other, still Walker[1] was right, I believe, in maintaining that an article becomes a common measure of value only by becoming a common medium of exchange. In a previous chapter it was pointed out that an economic price could not exist independently of an exchange.[2] This being true, the manner in which the exchange process itself is effected by the different media of exchange offers the most natural criterion on which to base a classification of those media in a study of their relation to prices.

Accordingly we divide the media of exchange into (1) money, and (2) credit instruments[3] and adopt with a

[1] "But, whatever it is which money does, as the so-called measure of value, it is incontestable that it does this incidentally to its work as the medium of exchange." *Money in its Relation to Trade*, etc., 27. Cf. Walsh, *The Fundamental Problem in Monetary Science*, 304.

The above contention does not deny that an article can be used as a unit of account without serving as a medium of exchange. Monetary history is full of instances of this kind. At this moment for example the bulk of the petty exchanges that are being made in the Philippine Islands, are at prices quoted in reales, and quartos, although these coins no longer circulate in the islands. The practice is still common in many rural communities in the United States of quoting prices in shillings. In all such cases, however, the unit of account is assimilated in value to the medium of exchange and its numerical importance is determined by the value of the medium of exchange. If the unit of length is the foot, and if an inch is one-twelfth of a foot, the inch may be used as a unit for expressing length, although no rule or tape an inch long is ever made; and if by law the linear unit known as the foot should be lengthened, so likewise would be the inch, representing as it would one-twelfth of the new foot. If the silver dollar should be the sole medium of exchange in a community, and if the shilling, representing one-eighth of a dollar, should be the unit of account, prices would be determined by the value of the dollar, and simply expressed in terms of the shilling or unit of account.

[2] Supra, 12.

[3] For a discussion of the various kinds of credit instruments cf. chap. viii.

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slight modification the following definition of money framed by Walker:[1]

> . . . Money is that which passes freely from hand to hand throughout the community, in final discharge of debts and full payment for commodities, being accepted equally without reference to the character or credit of the person who offers it, and without the intention of the person who receives it to consume it, or enjoy it, or apply it to any other use than, in turn, to tender it to others in discharge of debts or payment for commodities.

This definition is to my mind the most satisfactory and workable scientific definition of money that has yet appeared.[2] It is based upon the most important function of money—the one from which all others are largely derived—it is comprehensive, reasonably precise, easily understood, and corresponds with popular usage. The only modification which it seems to require is the alteration of the last clause so as to read, "without the intention of the person who receives it to consume[3] it otherwise than in tendering it to others in discharge of debts or payment for commodities, or in holding it with those purposes in view."

[1] *Money, Trade,* etc., 4.

[2] "Whatever view is taken of the nature of money," says Kinley, "must be derived from the determination of its services or functions." And again, money is "that part of the medium of exchange which passes generally current in exchange and settlement of debts, without making the discharge of obligations contingent on the action of a third party, or on the action of the payer by promising redemption if the money article does not pass." *Money,* 59, 70, 71.

[3] Money used in the performance of a money function is giving off utilities and being consumed, in the economic sense of that term, as truly as is any other economic good which is being used to gratify want. "*Economic consumption is the enjoyment of the utilities which wealth is capable of affording.* . . . The essential mark of consumption is the using of the income as it arises, not necessarily the using up of the material agents that afford it, though this frequently occurs as well." Fetter, *Principles of Economics,* 392.

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CHAPTER IV

INCONVERTIBLE PAPER MONEY

The essential differences between the exchange system of the hypothetical society so far developed and that of our modern industrial society, are (1) that the hypothetical society is an isolated community, (2) that credit transactions are unknown, (3) that there is only one kind of money, although there may be any number of denominations, and (4) that the material of which the money is composed possesses no other use than the money use. These conditions, it is to be observed, would be almost perfectly realized in an isolated society where the sole medium of exchange was inconvertible paper money.[1] Nor is it necessary to continue

[1] "The nearest approximation to the simple form of the quantity theory is found in the case of inconvertible paper. If the term 'inconvertible' be taken strictly and absolutely,—if there is not even a conditional or deferred or anticipated chance of conversion into gold or some other valuable,—then, other things remaining the same, the value of the paper will depend on the quantity issued." Nicholson, *Principles*, II. 125. Cf. Mill, *Principles*, II. 89 et seqq., and Walker, *Political Economy*, part III. chap. v.

As commonly used, the expression "inconvertible paper money" has a much broader significance than that given to it in the quotation above cited from Nicholson. It usually refers to money of which there is a "deferred or anticipated chance of conversion," and which is receivable by the government for taxes and other public dues. The most typical forms of inconvertible paper money are found in such currencies as the bank of England notes at the time of the suspension of specie payments, or the greenbacks of the United States prior to 1879. "By the word Inconvertible . . . is meant that the paper, whatever it promises and however it is guaranteed, is not, in fact, whatever be the fiction of the law, subject to conversion, on the demand of the holder, into metallic money." Walker, *Money*, 276.

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to assume that the society is an isolated one. Inconvertible paper having currency only in the country where issued.[1] will not be exported in payment of trade balances due to foreign countries.

The applicability of the quantity theory to a régime of inconvertible paper money has of late been strenuously denied by several writers on monetary theory. H. Parker Willis,[2] a few years ago, criticized Mill's position on the subject, saying:

> . . . It ought to be clear that the value of an inconvertible note will depend upon precisely the same circumstances as regulate the value of any bond-note or other obligation, whether of the government or of an individual. Such obligations do not, of course, depend for their value upon the quantity issued, so long as that quantity is within the limits of solvency. . . . The quantity theory, however, is seen in its most extreme and characteristic form when it is applied to a régime where no coin circulates but irredeemable paper is the sole medium of exchange. To the question what determines the value of such irredeemable paper, the reply is returned that the amount in circulation is the sole regulator of value. Public confidence in redemption plays no part. Government solvency or insolvency is an irrelevant consideration. It makes no difference whether or not the national promise to pay represents a capacity to meet an obligation; the value depends wholly on the quantity of these promises in circulation.

From what has been said it should be apparent that this criticism is based upon an entire misinterpretation of the position taken by adherents to the quantity theory. The demand for money, all adherents to that theory insist, is just as truly an element in the determination of prices as is its

[1] "Limited circulation is the essential characteristic of Inconvertible Paper Money." Ib. 378.

[2] *Jour. Pol. Econ.*, IV. 434, 442 (September, 1896).

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supply. In the formula $P = \frac{MR}{NE}$, a variation in N, E or R is just as effective in causing a change in P as is a variation in M. No one maintains for a moment, as Willis asserts, that "the amount [of money] in circulation is the sole regulator of value."[1] In the price formula, M is only one factor in four and an alteration in any of the other factors is as effective in influencing prices as is an alteration in M. Furthermore, all of these three other factors are decidedly influenced by changes in public confidence in the government, and by varying prospects for redemption. If the value of the money unit is being supported by the prospect of future convertibility and public confidence in the government begins to wane, people will not be so willing as formerly to give their goods in exchange for the money. Fewer commodities will be exchanged, while barter and the use of money substitutes will be resorted to.[2]

[1] Wesley C. Mitchell exhibits the same misconception of the position taken by the adherents of the quantity theory when he criticizes it by saying that, "Some might reply that, on the contrary, it would seem natural to suppose that the value of inconvertible paper is least likely to depend on the quantity of it; that its value will conform, in fact, to the confidence felt by the public mind, that the paper will some time be redeemed; and that the issue of a great quantity is likely to cause depreciation, because it will shake this confidence, since it is a public confession of the financial weakness of the government." *Quantity Theory of Money* in *Jour. Pol. Econ.*, IV. 151 (March, 1896).

[2] "When we speak of a debased coinage circulating without depreciation, if not in excess of the amount of money of full value which might circulate in the community at the time, it must be understood always with the proviso, that nothing in the public mind limits the circulation of such a debased coinage; for, should it be blown upon, should prejudice arise against it to such an extent that, rather than receive it, people will resort to barter, in spite of all its inconveniences, or to extended credit leading to the mutual cancellation of obligations, then we should have a new condition; the demand for money would be diminished just so far; and an amount of coin not in excess of the amount of money of good repute which would circulate freely, might become redundant and hence

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A paper money readily and at all time redeemable in metallic money on demand cannot depreciate below the value of the coin in which it is redeemable. The right to demand an income in the future has a present value equivalent to that income discounted for estimated risk and for time.[1] An inconvertible paper money whose redemption in the future is assured or probable, cannot fall below the present value of that future good into which it is to be convertible, as that value is determined by the competition of the market. It may, however, by reason of its scarcity, appreciate above that value. Variations in the prospects for redemption may be important factors in the demand for money, as they may likewise be in the supply through their influence on the rate of monetary turnover; they affect the value of money, however, only through affecting its demand or supply in harmony with the principle of price determination previously explained.[2]

depreciated." Walker, *Money*, 198, 199. The above proviso with reference to a debased coinage, Walker said, must be likewise introduced with reference to the value of inconvertible paper money. Ib., 279.

"I think it is agreed that, if the credit of a currency falls, its value falls relatively to commodities, even when there is no change in its volume. I think it is agreed that the history of the assignats and the American currency during the time of the forced paper currency shows that." Marshall, "Testimony before Indian Currency Committee," in *Report*, etc., Q. 11,762.

[1] Cf. infra, chap. v.

[2] Cf. supra, 4–7, 11–16.

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CHAPTER V

TOKEN MONEY

The expression *token money* refers to coins whose money value is greater than the market value of the principal constituent metal by an amount more than sufficient to cover the expenses of coinage. The test of token coins is the existence of a net seigniorage. Token money may circulate conjointly with primary money and be directly or indirectly redeemable in such money, as for example the silver coins of the United States and of the Latin Union, or it may circulate independently of primary money as in the case of the Indian rupee from 1893 to 1899,[1] of the currency of the Philippine Islands for some years prior to the American occupation,[2] and of the dollars of the Straits Settlements[3] at the present time. The subject of convertible token money will be considered in chapter seven. For the present we will limit our discussion to the principle determining the value of inconvertible token money in a régime in which such money is assumed to be the sole medium of exchange.

Such a régime would differ from the inconvertible paper money régime assumed in the preceding chapter only in the fact that the material of which the token money was composed would possess a value independent of its money use.[4]

[1] Infra, 36–39.

[2] *Second Annual Report of the Chief of the Division of the Currency for the Philippine Islands*, 21 et seqq. Cf. infra, 39 note.

[3] Kemmerer, *A Gold Standard for the Straits, II*, in *Political Science Quarterly*, XXI., 665–677 (December, 1906).

[4] Marshall in his evidence before the Indian Currency Committee of 1898 said: "Since the mints were closed, the currency of India has consisted of Government notes printed on silver." *Report*, etc., Q. 11,790.

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Would that fact require a modification of the principles so far developed? If so, to what extent? In such a society subjective prices would continue to be the valuations placed upon the various commodities in terms of the valuations placed upon the money unit by the various members of the community. Economic prices would emerge, as before, only in exchange transactions, and would be determined in each case, in the manner previously described,[1] by the valuations placed by the marginal pair upon the commodity and the money respectively. The subjective valuations placed upon commodities and money would, moreover, vary in accordance with the law of diminishing utility. The fact that the money was made of silver rather than of paper would affect its value only through its influence on the monetary supply (MR) or the commodity supply (NE). It would place a limit upon the possibility of excessive issues and would be a guaranty to the public that the money would not depreciate materially below the value of its bullion content. The fact of its being made of silver might, moreover, stimulate greater public confidence in the money and induce people to be willing to hold it in larger quantities than they otherwise would,[2] and to utilize it to a greater extent in effecting their exchanges. In this manner the fact that the money possessed a value as bullion might affect prices by influencing the rate of monetary turnover (R) and the number of commodity exchanges to be effected by money (E).

The value of token money is therefore determined by the same fundamental law of supply and demand as was shown

[1] Supra, 3–8.

[2] "Their value [i. e. that of rupees] is governed in the main by their amount relatively to the work which they have to do; account being taken of the fact that apprehensions as to the stability of the value of such a currency will affect the amount of purchasing power which people care to keep directly or indirectly in the form of currency." Marshall, Ind. Curr. Comm., 1898. *Report*, etc., Q. 11,790.

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to apply to inconvertible paper. The bullion value of the token simply marks a lower limit to its possible depreciation, and by its influence on public confidence becomes an element of greater or less importance in the monetary demand. It is, however, only when the coin has appreciated above its bullion value that it is entitled to be called token money at all. Token money, like inconvertible paper money, presents a case of the familiar principle of monopoly value: limit the supply while the demand is increasing and you will raise the value, and the rise in value will be proportionate to the increased demand.

When token or paper money is used, primary money is to that extent dispensed with, and an economy in the metal used for primary money is thereby effected, its value becomes less than it otherwise would have been, and the amount economized is distributed between the merchandise and the monetary uses, the amount going into the monetary use being proportioned among the different countries in such a way that a new equilibrium of prices is attained.[1] A change in the value of the bullion in token coins, can, however, *caeteris paribus,* bring about a change in general prices only in so far as it affects the actual amount of money in circulation. To quote the words of Ricardo:[2]

. . . There can exist no depreciation of money but from excess. However debased a coinage may become, it will preserve

[1] Cf. *Letters of Ricardo to Malthus,* 11 et seqq. Cf. infra, 43–47.

[2] *Works,* 347.

For many years Spanish-Filipino coins circulated in the Philippine Islands concurrently with Mexican dollars, and at a par with them, although the bullion value of Spanish-Filipino coins was from eight to twelve per cent. below that of the Mexican dollar. Both moneys passed current at a gold value materially above that of the bullion content of the Mexican dollar. Cf. *First Annual Report of the Chief of the Division of the Currency for the Philippine Islands,* 11, 12; *Second Annual Report,* etc., 14, 15, 21–28, and infra, 39 note.

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its Mint value, that is to say, it will pass in circulation for the intrinsic value of the bullion which it ought to contain, provided it be not in too great abundance. It is a mistaken theory, therefore, to suppose that guineas of 5 dwts. and 8 grains cannot circulate with guineas of 5 dwts. or less. As they might be in such limited quantity that both the one and the other might actually pass in currency for a value equal to 5 dwts. 10 grains, there would be no temptation to withdraw either from circulation; there would be real profit in retaining them.

A more striking illustration of the principle determining the value of token coins could hardly be imagined than the familiar history of the Indian currency reform from the closing of the Indian mints on June 26, 1893, to the practical establishment of the 16*d* par in March, 1899.[1] Prior to the closing of the mints the value of the rupee, as measured by sterling exchange, followed closely the value of silver, because through the system of free coinage the money supply responded quickly to changes in the value of silver. The closing of the Indian mints divorced the value of the rupee from that of its silver content, by preventing the supply of rupees from responding to alterations in the value of silver.[2] The fundamental fact in the appreciation of the rupee was the restriction of its quantity. This was the means by which the Indian Government expected to enhance the value of the

[1] For an admirable discussion of the Indian currency reform which it would be well to read in connection with this chapter, cf. Robertson, *The Currency Policy of India,* in the *Journal of the Society of Arts,* March 27, 1903; reprinted in the *Report on the Stability of International Exchange,* by the Commission on International Exchange, 357–376.

[2] "For a period after the closure of the mints, the rupee fluctuated more or less with the fluctuations of silver, though the exchange value of the rupee was immediately raised materially above its intrinsic value, and, since the 26th of June, 1893, there has been no indication of a decline in that value to the level of silver bullion." J. E. Oconor, C. I. E., Director General of Statistics to the Government of India. Ind. Curr. Comm., 1898. *Report,* etc., Q. 923.

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rupee, and this was the means by which that result was accomplished.[1] The idea was well stated by Mr. W. H.

[1] The course of the appreciation of the rupee is shown in the following table: The figures for the bullion value of the rupee were computed from the average monthly prices of silver given in the *Second Annual Report of the Chief of the Division of the Currency for the Philippine Islands,* the other figures were taken from the paper by J. Barr Robertson cited on the preceding page.

Years Ended March 31.	Bullion Value of Rupee, Based Upon Average Daily Price of Standard Silver in London. (d.)	Average Rate of Council Bills. (d.)	Index Numbers of Prices of Exports and Imports at Calcutta. Prices in 1873 = 100.
1890		16½	94
1891	17 3/16	18	89
1892	16 11/32	16¾	94
1893	14 15/32	15	100
1894	12 3/32	14½	101
1895	10 17/32	13	105
1896	11 3/8	13⅜	103
1897	11 9/32	14½	101
1898	9 7/8	15⅛	93
1899	10 5/32	16	97
1900	10 3/16	16	107
1901	10 9/16	16	111
1902	9 13/16	16	

"In connection with the rise of Indian prices from 1893 to 1895, it ought to be recorded that, immediately after the closing of the mints, the Government accepted from banks and others silver to the amount of Rx. 2,000,000, which had been shipped to India before the closing of the mints, and coined it. As silver had in the meantime fallen in value as compared with rupees, these Rx. 2,000,000 would generally remain as coin, as they were too valuable to be melted down for use in the arts. Then a change was made in the amount of rupees held in the currency reserve, which enabled the Government to withdraw Rx. 2,000,000 from the reserve. Thus Rx. 4,000,000 were added to the actual circulation, and it is generally believed that a considerable quantity of rupees came out of hoards and passed into the circulation. From these sources rupees were added that raised the Indian prices to 105 in 1895, and it may have been that the large imports of silver from 1890 to 1893 had also a continuing effect for some time. . . . Act No. XXI. of 1896 . . . released 20,000,000 silver rupees from the currency reserve, and replaced them by a corresponding amount in securities." Robertson, 427, 429.

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Cheetham, when he said: "The closing of the mints has reduced the volume of the currency in relation to trade. Population is always increasing, and trade is expanding; if you do not continually add to the currency, you actually in fact reduce it; that is to say, it is reduced in relation to requirements."[1] Other causes[2] for the advance in the value of the rupee have often been given, but their careful analysis will show that they are, without exception, merely phases of this fundamental cause, that is, the contraction of the currency relative to trade demands. I can find no evidence whatever to show that the prospect of future redemption in gold was an appreciable element in affecting the value of the rupee, as Laughlin appears to maintain.[3] Such an idea at least seems to have escaped the Indian Currency Committee and the witnesses who appeared before it, as well as the Indian Government. The following extract taken from a letter written by the Government of India to the Secretary of State for India,[4] under date of March 3, 1898, is apposite.

. . . Our experience since 1893 has put beyond doubt one of the main principles upon which the legislation of that year was based—a principle which was challenged at the time—namely, that a contraction in the volume of our silver currency, with reference to the demands of trade, has the direct effect of raising its exchangeable value in relation to gold. Before 1893, while the mints were yet open, the value of the rupee as

[1] Ind. Curr. Comm., 1898. *Report*, etc., Q. 8,713.

[2] Such for example as "the diversion of rupees from the commercial centers to the interior of the country" (Ib. Q. 989). "Large borrowings in London on account of India, reduction of the drawings of the Secretary of State [and] an increase in the exports from India unaccompanied by an equivalent increase in imports." Ib. *Final Report*, 13.

[3] *Principles*, 526.

[4] Commission on International Exchange, *Stability of International Exchange*, 333.

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measured in gold continually declined with the decline in the value of silver; but since 1893, although the value of silver as a metal has continued, speaking generally, to decrease, the decrease in the value of the rupee has been arrested. The main difference in the conditions of the two periods was that before 1893 the amount of coin in circulation was allowed to increase automatically so as to be sufficient to meet the demands of trade at its reduced value, while since 1893, this automatic increase being stopped, the value of the rupee has been determined rather by the amount of coinage in circulation than by its intrinsic worth.

The possibility of raising the value of inconvertible token money by limiting its quantity is supported by abundant historical evidence.[1] It is, as previously stated, but an illustration of the principle of monopoly value under the more general law of supply and demand.

[1] At the present time the new Straits dollar is worth much more than its bullion value, on account of the recent relative contraction in the Straits currency supply. The money of the Philippine Islands for some years prior to August, 1898, circulated far above its bullion value owing to restriction of its quantity, although there was no actual or prospective convertibility into gold. During the fore part of 1904 the value of the Mexican dollar in Manila stood for some time considerably above its bullion value and above its value in Hongkong, by reason of a legal prohibition on its importation into the Philippines, although it was being discriminated against by the Philippine Government, and there was a law on the statute books to become operative October 1, providing for its taxation out of circulation. At the present time (October 19, 1906), the opposite phenomenon exists in the Philippines. The Philippine peso is worth as bullion in London about seven per cent. more than its sterling value in the Philippines, after allowing for all expenses of transportation, but is being kept below its natural value in the Philippines because its exportation is prohibited by statute, and the reduction in its relative supply, which is a condition *sine qua non* to its appreciation, is thereby prevented. Cf. Kemmerer, *The Establishment of the Gold-Exchange Standard in the Philippines,* in *Quar. Jour. of Econ.,* XIX. 600–605 (August, 1905); *Sec. Ann. Rep. Chief Div. Curr.,* etc., 14, 15, 21–28, and *A Gold Standard for the Straits,* II., in *Pol. Sci. Quar.,* XXI., 665–677 (December, 1906).

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Such money, regardless of any prospects of convertibility, performs all the essential functions of money. It conditions the gratification of want and therefore possesses value; it serves as a common medium of exchange, and in doing so performs the function of a measure or standard of value.

Before closing this chapter it will be well to consider for a moment a recent criticism brought by a well known writer on money against the principles here upheld. Scott in his recent book on *Money and Banking* says: "All are agreed that under the head *money* we must include the *standard of value* and the *medium of exchange,* two instrumentalities which perform very different functions. . . ."[1] He later divides standards of value into two classes, "primary standards" and "secondary standards."[2] By primary standards he means commodity standards, that is, money whose value as money corresponds with the market value of the constituent metal. By secondary standards he apparently means all forms of money not possessing a bullion value equal to their money value, although he nowhere carefully defines this term. "Secondary standards," he says, "are based upon the primary in the sense that their value is derived from them and that their independent existence is impossible. In other words, a community may have a primary standard of value without a secondary, but cannot have a secondary standard without a primary."[2] Prices are defined as "simply the numerical expression of the ratios of exchange between every other commodity and the standard commodity,"[3] and the "chief fallacy of the quantity theorists" is declared to consist in the fact that "they entirely overlook the necessity for a commodity standard."[4]

[1] Ib., 1.
[2] Ib., 37.
[3] Ib., 35.
[4] Ib., 57 et seqq.

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From what has already been said the fallacy of Scott's position as above outlined should be evident. In the first place his definition of the term prices is faulty. Prices are the values of commodities in terms of the value of the money unit, and not their values in terms of the value of the standard commodity as Scott and Laughlin[1] maintain. It is often true that the value of money and the value of its principal constituent metal are essentially the same.[2] This agreement is, however, by no means a necessary one, and where the two values disagree, it is the exchange value of the money that represents prices, and not that of the constituent metal. The fact that gold and the gold exchanges are quoted in terms of inconvertible token or paper money[3] does not constitute gold the standard of value, any more than does the fact that silver and the silver exchanges are quoted in terms of such money make silver the standard of value, or the fact that the value of wheat is quoted in terms of such money make wheat the standard of value. Coins that condition the gratification of want possess value, and in being exchanged for commodities measure value, regardless of whether the demand for them is influenced or not by the value of their

[1] Laughlin defines prices as "the quantity of the money commodity for which a given article will exchange." (*Principles*, 355). Again he says, "Whatever may be the various theories suggested as regulating the value of gold, or of a given commodity, we cannot escape the fact that exchange value between gold and goods is the problem of the value of money. And there seems to be a general concurrence in this simple proposition." In support of this conclusion he quotes Mill's definition of the price of a commodity as "the quantity of money for which it will exchange" and Hadley's statement that "A price in the commercial sense of the word may be defined as the quantity of money for which the right to an article or service is exchanged." The quotations, it will be noted, are quite different from the proposition which they are quoted to support. *A Theory of Prices*, in *Publics. Amer. Econ. Assoc.*, third series, VI. No. 1, 66, 67 and note (February, 1905).

[2] Infra, 43–48; 54–59.

[3] Cf. Scott, *Money*, etc., 59–61.

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constituent metal or the prospects of convertibility. And when such coins are passed from hand to hand regularly in the effecting of exchanges, they become *ipso facto* a standard of value. It is difficult to see what could have been the standard of value, according to Scott's theory, in the United States from 1863 to 1879, in India from 1893 to 1899,[1] and in the Philippines for the decade or more ending with the American occupation,[2] to mention only a few of many possible cases where the standard has not been a "commodity standard," or convertible into a "commodity standard" except by purchases in the open market.

Another criticism made by Scott to the quantity theory, as defended in this chapter and the one preceding, is summed up as follows: "It has been a most fruitful source of false doctrines regarding monetary matters, and is constantly and successfully employed in defence of harmful legislation and as a means of preventing needed monetary reforms."[3] If this statement should be admitted to be true, does it have any bearing upon the scientific truth or falsity of the quantity theory? The fact that a principle is misinterpreted or misused, may give cause for the exercise of great care in its promulgation and explanation; it does not, however, have any bearing upon the validity of the principle as a scientific proposition. The two ablest defenders of the quantity theory, Ricardo and Walker, were both outspoken in their opposition to the use of inconvertible paper money. The fact that hypnotism, for example, is used by charlatans and quacks as a means of profit does not affect that phenomenon as a scientific fact or lessen the therapeutic value it may be found to have in the service of worthy physicians.

[1] Supra, 37 note.
[2] Supra, 39 note.
[3] *Money*, etc., 68.

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CHAPTER VI

A GOLD MONETARY RÉGIME

Proceeding with the development of our hypothetical society, let us suppose that the medium of exchange consists exclusively of gold coins, and that coinage is both free and gratuitous, and ask ourselves what would be the relation between the circulating medium and general prices under such conditions.

Such a régime differs from the token money régime postulated in the preceding chapter, in the fact that the money supply is permitted to respond quickly to alterations in the value of the constituent metal, that bullion can be readily transformed into money and money into bullion without appreciable expense, and that the amount of money in circulation is determined entirely by trade conditions, and not by dictates of government. Do these facts, as some maintain,[1] require any alteration in the principle of price determination so far laid down?

Gold is a commodity. Its value is determined by the same general laws that determine the value of other commodities. It is an article of merchandise in every country of the world, and in every country has a variety of uses. It is used for money, for jewellery, for gilding, for plating, for dentistry and for a hundred other things. In each of these uses it yields a great number of different utilities; its value in each use is determined by its marginal utility in that use, and, inasmuch as a ready flow of gold from one use to another is possible, the marginal utilities in all uses must at any time be approximately the same. The value of gold as a com-

[1] Cf. Kinley, *Money*, 141 et seqq.

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modity will in all cases be determined by that one of these different marginal uses which for the time being is the lowest, this marginal use representing the marginal use of gold in its generic sense. If we assume a world market, and, for convenience, classify all these uses under two general heads, (1) monetary use, and (2) merchandise use, it is evident that the value of gold in one use cannot long materially exceed its value in the other use. Gold can be readily transferred from one use to the other use,[1] while the equilibrium is continually being maintained by the infusion of newly-mined gold into that use where the marginal utility is the higher. The lowest of these two marginal utilities, that is the one determining the value of gold in its generic sense, is therefore continually passing from one use to the other. The value of gold is accordingly sometimes dependent upon a merchandise use and sometimes upon a monetary use. The smelters, brokers and miners, with the bullion are the sellers, and the competing buyers are the mints on the one hand, and the jewellers, chemists, and so on, on the other.

Perhaps no better illustration of this principle can be given than the following, adapted from Pantaleoni:[2]

Let us suppose two laws regulating the demand for gold, the first in respect of its use as money; the second in respect of its industrial consumption. Let the two laws of demand, expressed by indices denoting the degrees of utility of successive portions of gold, assume originally the following form for a series of groups of individuals:

[1] In the merchandise form the metal is usually compounded with a larger amount of labor than in the monetary form. For jewellery to be melted down and brought to the mint, the gain from the transaction must be at least sufficient to offset the "form utility" of the jewellery; while a flow from the monetary into the non-monetary form will take place as soon as the utility to be gained from such a transfer exceeds the seigniorage, if any, and the dis-utility involved in the transaction itself. *Pure Economics*, 228, 229 note.

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First Law of Demand.

[Monetary Use.]

Degrees of Utility of Successive Increments for each Group of Persons.

[Groups.]		
1st	2nd	3rd
10		
9	9	
6	6	6

Second Law of Demand.

[Merchandise Use.]

Degrees of Utility of Successive Increments for each Group of Persons:

[Groups.]						
1st	2nd	3rd	4th	5th	6th	7th
15						
14	14					
13	13	13				
12	12	12	12			
11	11	11	11	11		
10	10	10	10	10	10	
8	8	8	8	8	8	8

Let the available quantity be 31 increments. These increments will be so distributed that 28 will be apportioned to the groups constituting the second law of demand, and 3 to the groups constituting the first law of demand. The final degree of utility of the mass will be 8, and this will also be the price of each increment. The value of the entire mass will be

$$8 \times 31 = 248.$$

Let us now suppose that whilst the second law of demand remains unvaried, the first is modified in conformity with the Roman numerals above the Arabic figures:

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First Law of Demand. [Monetary Use.] [Groups.]					*Second Law of Demand.* [Merchandise Use.] [Groups.]						
1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th	6th	7th
					15						
					14	14					
					13	13	13				
XII					12	12	12	12			
XI	XI				11	11	11	11	11		
10	X	X			10	10	10	10	10	10	
9	9	IX	IX								
					8	8	8	8	8	8	8
6	6	6	VI	VI							

Let the available mass of 31 increments remain unaltered; these will then be distributed so that the persons composing the second law of demand will receive 21, and those composing the first law 10; and the final degree of utility of the mass will be 9, which will also be the price of each increment. The entire mass will be equal to $9 \times 31 = 279$.

Carrying Pantaleoni's illustration one step farther, let us suppose that while the first and second laws of demand remain unchanged, the available supply of increments is increased from 31 to 38. The 38 increments will then distribute themselves between the two uses, as before, in such a manner as to yield the highest utilities. Inasmuch, however, as the highest next seven utilities are all in the merchandise use, the seven additional increments will all flow into that use.[1] The value of an increment of gold as mer-

[1] The value of some commodities falls slowly and comparatively uniformly with increases in the supply, that of others rapidly and by jumps. In modern industrial society there could not be, under a free coinage system, so great a difference between the marginal utility of gold money and that of gold as merchandise as above assumed. In the illustration an extreme and simple case is supposed in order to bring out the principle more clearly.

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chandise will fall to 8, the value of the money unit will remain unchanged. The marginal utility in the money use will still be represented by 9, and the total value of the money supply by 90. The value of the generic thing, gold, will have been altered without having caused any alteration in the value of money. The monetary demand will have remained unchanged, and the increased supply of gold will have had no effect on the money supply. The demand for money remaining unchanged, alterations in the value of gold can only affect prices through affecting the money supply.[1]

Giffen has criticized adherents of the quantity theory on this point. The quantity theory he refers to as proceeding "on the assumption that there is a pool of money into which a balance of the precious metals falls after other uses have been satisfied, and that prices rise or fall proportionately with an increase or diminution of the pool."[2] On the same page, however, he declares the money demand to be

> mostly for a fixed amount of the precious metals, and it is a demand at the same time of a very imperative kind, which will be satisfied at almost any ratio of exchange with other commodities, because money serves a great necessity, and the amount required is at the same time so small in proportion to the wealth of modern societies that the price paid for it is unfelt. The money demand, therefore, can hardly ever be that last margin of demand to which the last margin of supply is

[1] It is generally admitted that the rise of world prices following the California and Australian gold discoveries, was due largely to the increased supplies of gold thrown on the market at that time. Suppose that the world's commerce had remained constant during that period, and that contemporaneously with the increased gold production there had appeared a new merchandise demand for gold that absorbed all the increased supply, permitting none to go into the money use, would prices have risen? Cf. infra, 56–59.

[2] *A Problem in Money*, in *Nineteenth Century*, XXVI. 870.

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adjusted, and by which the ratio of exchange between the precious metals and other articles will be finally settled. Gold and silver, therefore, while used as money, are not only merchandise, but the regulator of the ratio between them and other articles must almost necessarily be some other than the money use.

It will be observed that Sir Robert Giffen commits the same error here that he attributes to believers in the quantity theory. It is no more correct to say that the money use is first satisfied, and then what remains flows into a pool for satisfying the merchandise uses, than to say that the merchandise uses are first satisfied, and the overflow forms a pool for the satisfaction of monetary uses. It is the old "residual claimant" fallacy over again.[1] Each use has its marginal utility, and the metal is continually passing from one to the other, while the new supply is apportioned between the two uses in such a way that it will yield the highest utility. If the money utility is always the higher, why, we may ask, is money ever melted down for the arts? Or, still further, how does gold ever find its way into the arts at all?

The relation between prices and money in a régime of the kind we are here considering can perhaps best be made clear if we assume a great increase in the production of gold, like those following the Californian and Australian gold discoveries, and ask ourselves what effect this will have upon general prices. The new supply of gold will find itself competed for by two different classes of demands, the monetary demand and the merchandise demand. The new gold will

[1] Laughlin commits the same error, when in referring to the distribution of bullion between the two uses he says: "If a stream of water from a hose be turned into a bucket, when the bucket is full, the excess of water will overflow on the ground and spread everywhere; in like manner, the stream of new gold will first flow into the circulation and reserves, if needed there, and all additional supplies will pass into the arts for general use." *Principles*, 338, 339.

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flow into that use where its marginal utility is the higher, and this higher marginal utility will vary back and forth between the monetary and merchandise uses. Both uses are capable of absorbing the new metal in practically unlimited amounts. A large part of the merchandise demand is for the making of ornaments and jewellery. These wants are of a peculiarly elastic kind, so that slightly reduced prices give rise to a considerably increased demand. The demand for gold for monetary purposes is a peculiar one. Money being the generally accepted medium of exchange, gives its possessor the privilege of drawing upon society for its value in commodities *at current prices.*[1] Inasmuch as men are creatures of unlimited wants, the individual's desire for money is unlimited. The new gold, we will say, comes first into the hands of the owners of the mines. An ounce of gold costs them, under the new conditions, a much less sacrifice to obtain than formerly; they have larger amounts, its subjective values to them fall, their subjective prices rise, and purchases which were formerly unprofitable to them are now made profitable, those who buy first get the advantage of the old prices, those who hold off are soon compelled to pay higher prices by reason of increased demands for goods. The merchants, from whom the mine owners buy, finding business prosperous, hold back their supplies for higher prices, and hasten to meet the new demand by ordering increased supplies of the wholesalers at the old prices, the wholesalers make haste either to buy increased supplies from the manufacturers at home at the old prices, or to import them from abroad.[2] In the former case the manufacturers will begin to buy new machinery and to hire more laborers to satisfy the increased demand, but here they may find difficulty.

[1] Supra, 12 note 1.

[2] Mill, II. 28–31.

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The increased gains to be made in mining will by this time probably have caused a scarcity of laborers for other pursuits, and additional labor will be obtainable only by the payment of higher wages. In the purchase of new machinery, it may be, they may still recoup themselves by buying at the old rates. The increased demand for machinery, however, will soon likewise cause its price to advance. Thus the new level of prices advances "by jerks" or by a "series of rebounds,"[1] passing from trade to trade and from country to country, until finally the proportion of the new metal going into the form of money has been absorbed by the different countries of the world and a new equilibrium of world prices has been established.

The above hypothesis is not fanciful, but has been realized on a large scale twice within modern times; once in the great silver and gold discoveries of the sixteenth century, and again in the Californian and Australian gold discoveries of the nineteenth century.

Cairnes in his admirable paper on *The Course of Depreciation,*[2] read before the British Association in 1858, pointed out the probable order in which the wave of higher prices resulting from the new gold discoveries would reach different countries and different trades. The wave of higher prices, he said, would first make itself felt in the mining regions of California and Australia, thence throughout the United States and England, from these countries it would move to the continent of Europe, affecting the principal markets first; from Europe it would move to Asia and to the more backward countries of the world. Each country in order would sell its commodities at the old prices to those countries receiving the gold supplies before it, and then hasten to recoup itself upon the countries which had not yet

[1] Walker, *Money,* 86.

[2] Cairnes, *Essays in Political Economy, Theoretical and Applied,* 53–76.

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received the new gold. In the more backward countries the business being less active the new gold would be absorbed less rapidly. Finally, the new gold would reach the most remote places, prices everywhere else would have risen and those places receiving the gold last, and having no place from which to buy commodities at the old prices, would lose largely what California and Australia had gained by their initial exportation[1] of gold.

In view of the peculiar demand for gold and silver in India and other countries of the East, for ornaments and for hoarding, as well as for a circulating medium, the predictions of Cairnes, it is well known, were not wholly realized. Many millions of ounces of gold went directly from the gold fields to the East, while, owing to the cheapness of gold, European countries in several instances took advantage of the opportunity to establish themselves upon a gold standard, and shipped their silver to the Orient.[2] Although the results differed in some particulars from Cairnes' predictions, the variations were variations of detail, and did not affect the essential truth of the general principle upon which he based his conclusions.[3]

[1] It is to be remembered that we are still assuming a régime in which credit instruments are unknown. A sudden and large increase in the production of gold in any country at the present time, would probably result in a rise of prices in many other countries long before the new gold could find its way into those countries. The close interdependence and extreme sensitiveness of the different markets of the world would hardly permit such a rise in prices to be even temporarily limited to one country. Merchants would hold back their supplies in anticipation of higher prices, the rate of monetary turnover would be stimulated, while the circulating medium would be increased by the more extended use of the various kinds of credit instruments—a subject to be discussed in a later chapter. Cf. infra, book I. chap. viii.

[2] There is a voluminous literature upon the subject of the effect of the Californian and Australian gold discoveries on prices. In addition to the writings of Cairnes already cited, those of Cliffe Leslie and Jevons are especially valuable.

[3] Cairnes, *Essays*, 159 et seqq.

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It is often asserted that an increase of prices due to a fall in the value of the precious metals must result in changing all prices in the same proportion. This would be true only after the adjustment had been completed, and on the assumption that the process of adjustment had itself left no lasting effects in changing the conditions of consumption or production.[1] An increase of money and consequent rise of prices stimulates industry, and during the period in which the new gold is being absorbed, the consumption of wealth by different classes of individuals, as well as its production in different industries, is affected quite differently. Furthermore, it is to be noted that new habits of consumption and new methods of production established during such periods of adjustment often become permanent.

Cairnes[2] discusses at length the probable effect of the new gold supplies on the prices of different classes of commodities. His general conclusions on this subject are sufficiently important to quote in full:

First.—That the commodities, the price of which may be expected first to rise under the influence of the new money, are those which fall most extensively within the consumption of the productive classes, but more particularly within the consumption of the labouring and artisan section of these. Secondly.—That of such commodities, that portion which consists of finished manufactures, though their price may in the first instance be rapidly raised, cannot continue long in advance of the general movement, owing to the facilities available for rapidly extending the supply; whereas, should the production, from overestimation of the increasing requirements, be once carried to excess, their prices in consequence of the difficulty of contracting supply, may be kept for some considerable time below the normal level. Thirdly.—That such raw products as fall

[1] Mill, *Principles*, II. 28 et seqq.

[2] *Essays*, 64, 65.

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within the consumption of the classes indicated, not being susceptible of the same rapid extension as manufactures, may continue for some time in advance of the general movement, and that, among raw products, the effects will be more marked in those derived from the animal than in those derived from the vegetable kingdom. Fourthly.—That the commodities last to feel the effects of the new money, and which may be expected to rise most slowly under its influence, are those articles of finished manufacture which do not happen to fall within the range of the new expenditure; such articles being affected only by its indirect action, and this action being in their case obstructed by impediments to the contraction of supply.

These predictions of Cairnes' were substantially verified by subsequent events.[1]

How do these facts conform with the quantity theory as expressed in the formula $P = \frac{MR}{NE}$? The stimulus given to both consumption and production by the increase of the quantity of money (M) will also bring about changes in the other four members of the price equation. Money will circulate more rapidly, those who keep it will find its value fading away in the higher prices arising, the first to dispose of it will be the greatest gainers for they will buy at the lowest prices. Rising prices furthermore will stimulate production and increase the number of commodities[2] to be exchanged. From the very nature of things Hume's[3] well known description of the effect of the gold and silver discoveries of the sixteenth century will be realized:

Accordingly we find, that, in every kingdom into which money begins to flow in greater abundance than formerly, everything takes a new face: labor and industry gain life; the merchant

[1] *Essays*, 159 et seqq.
[2] Walker, *Discussions*, I. 221–236.
[3] *Essays*, I. 313.

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becomes more enterprising, the manufacturer more diligent and skillful, and even the farmer follows his plow with greater alacrity and attention.

It has been found that an increased gold supply would result in a rise of prices, unless offset by a proportionate or greater increase in the demand for gold, and that the extent of this rise of prices would be different, for some time at least, for different classes of commodities. How, it may be asked, is the increase in general prices thus resulting related to the change in the volume of the money supply? Is the increase, other things being equal, proportionate to the increase in the money supply, or does it vary in some other way? A frequent answer to this question is to say that gold is a commodity; that its value is determined by the same laws that determine the value of other commodities; that money likewise is a commodity and its value is no more nor less than the value of the gold it contains. Increase the amount of gold, and if the demand remains the same, its value falls; diminish it, and its value rises; but, it is added, there is no more reason to say of money than of other commodities that its value rises or falls in proportion to the increase or diminution of its quantity.[1]

At this point we must take exception. The word *commodity* is a good one in its place, but it is often used to cover up a difficulty rather than to explain it. There are commodities and commodities, and while all classes of commodities are subject to certain fundamental economic laws, each class has peculiarities of its own. One class is composed of production goods, another of consumption goods, one of material things, another of immaterial services, one of commodities which are quickly perishable, another of commodities which can be easily preserved for long periods of time.

[1] Cf. Farrer, *Studies in Currency*, 185–187; Kinley, *Money*, 141–144; and Laughlin, *Principles*, 271–273.

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The value of some commodities, like bread and grain, falls rapidly with every increase in their quantity; the value of others, like jewellery and ornaments, falls only slightly though their quantities be considerably increased. The value of a given commodity is often a very different thing than the value of its constituent materials. It is obviously incorrect to say that an article is a commodity and then to infer that you have proven that it has all the qualities belonging to a certain other commodity, and no qualities peculiar to itself. Gold is a commodity; it obeys the laws of demand and supply as truly as do other commodities; it is more durable, however, than most commodities, the circumstances connected with its production are such that its cost of production is exceedingly difficult to determine, its quantity is so great that the new supplies from year to year have little effect upon its value, its value decreases very slowly with increases in its quantity, and so on. Money, too, is a commodity in the sense that it obeys the same general economic laws that other commodities do. As a commodity it possesses many of the peculiarities of the material of which it is made. It is, however, more than merely a piece of metal with a stamp upon it. *It is money,*[1] and in the performance

[1] The subject of this monograph is the value of money and not the value of gold, we are therefore concerned with the value of gold only in so far as it affects the value of money. The truth or falsity of the theory under discussion in no wise depends upon the merits of the different sides of the controversy concerning the relation of the cost of production to the value of a commodity. "On whatever theory the value of gold is explained," says Laughlin, "the outcome, as regards price, must be ultimately the same. If, with one school, we regard the value of gold as determined by the final utility of the last accretion got from the poorest mine in operation; or if, with another school, we regard the expenses of production at the poorest mine as fixing the value of gold in the long run,—it makes no difference. In either case the direct influence of demand and supply is admitted." *Principles,* 337. Cf. Kinley, *Money,* 163, et seqq., Leroy-Beaulieu, *Traité Théorique et Pratique d'Économie Politique,* III. 147–153, and supra, 41, 42.

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of the functions of money it has certain peculiarities of its own.[1] One of these is that, other things being equal, changes in its value are only made possible through proportionate changes in its quantity. If the gold supply is increased part will go into the merchandise use, and part into the money use according to the principle already explained.[2] The new supply may be divided between the two uses in any conceivable proportion, but, *caeteris paribus,* the value of money will only depreciate in proportion as the amount of gold going into the money use increases. If by reason of restrictions on coinage, or of a simultaneous increase in the merchandise demand for gold, the entire new supply is taken into the merchandise use, the value of money will be unaffected. Mill's[3] explanation of this point is worth quoting:

> . . . There really is, in one respect, a closer connection between the values of money and its quantity, than between the values of other things and their quantity. The value of other things conforms to the changes in the cost of production, without requiring, as a condition, that there should be any actual alteration of the supply: the potential alteration is sufficient;[4]

[1] Cf. Carver, *Discussion on the Theory of Money,* in *Publics. Amer. Econ. Assoc.,* third series, VI. No. 1, 126–130 (February, 1905).

[2] Supra, 43–47.

[3] Mill, II. 43, 44.

[4] A prospective alteration in the supply of any commodity generally makes itself felt immediately upon the price through the influence it exerts upon the present demand and therefore upon the relative supply. Advance reports of a large wheat crop, for example, cause purchasers to withhold their purchases in anticipation of lower prices, and holders of wheat to throw their holdings upon the market in order to realize upon them before the prospective fall in prices takes place. The result is an immediate increase in the relative supply and a consequent decline in prices. This principle is illustrated on a large scale in our stock and produce exchange operations. It is likewise applicable to the money side of the price ratio. A prospective heavy increase in the money supply, would have a tendency to increase the rapidity of monetary turnover,

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and if there even be an actual alteration, it is but a temporary one, except in so far as the altered value may make a difference in the demand, and so require an increase or diminution of supply, as a consequence, not a cause, of the alteration in value. Now this is also true of gold and silver, considered as articles of expenditure for ornament and luxury; but it is not true of money. If the permanent cost of production of gold were reduced one fourth, it might happen that there would not be more of it bought for plate, gilding, or jewellery, than before; and if so, though the value would fall, the quantity extracted from the mines for these purposes, would be no greater than previously. Not so with the portion used as money; that portion could not fall in values one fourth, unless actually increased one fourth; for, at prices one fourth higher, one fourth more money would be required to make the accustomed purchases; and if this were not forthcoming, some of the commodities would be without purchasers, and prices could not be kept up. Alterations, therefore, in the cost of production of the precious metals, do not act upon the value of money except just in proportion as they increase or diminish its quantity; which cannot be said of any other commodity. It would, therefore, I conceive, be an error, both scientifically and practically, to discard the proposition which asserts a connection between the value of money and its quantity.

Ricardo developed this idea at considerable length in his letters to Malthus as well as in his *Reply to Bosanquet.*

and to induce sellers of merchandise to hold back their supplies in anticipation of higher prices, with the result that there would be an immediate increase in the money supply (M R) relative to the commodity supply (N E), and an accompanying rise of prices. This process would be in perfect harmony with the principle of the quantity theory. It may well be doubted if the mere "potential alteration" in the supply of other commodities than money is as effective in changing their value as Mill asserts; he is right, however, when he asserts that money is the only commodity whose value, other things being equal, varies in proportion to changes in its quantity.

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The value of money is expressed through its quantity in the process of price making, and alterations in the value of gold only affect prices, other things being equal, in proportion as they affect the quantity of money in circulation. One of the most interesting of the many illustrations of this principle afforded by monetary history is that cited by Cairnes in his essay on *The Australian Episode.* Prices in the Australian gold regions rose enormously and the wages of common labor, which had ranged from three shillings to five shillings a day before the gold discoveries, increased to something like twenty shillings a day while these discoveries were at their height.

> . . . For more than a year after the gold discoveries had occurred, it [the general price level] was held sensibly in check by the peculiar state of the local currencies. For there was at this time no mint in Australia; the increased requirements for coin could only be met by a transmission of bullion to London, there to be coined, and afterward re-imported; and this process required from six to eight months at the least for its accomplishment. Pending the arrival of the new coins, prices were not indeed prevented absolutely from rising; for numerous expedients were in their absence freely resorted to for supplying the place of the ordinary currency; but nevertheless prices were, by the straitness of the circulation, kept very considerably under the natural level, as determined by the cost of gold,—a fact which was sufficiently proved by a remarkable fall in the price of gold throughout the whole of this period.

"A fall," Cairnes adds in a foot-note, "from £3 17s. 10½d. per ounce, the London mint price, to 60s., 50s., and, it is stated, in some instances to 40s. per ounce."[1]

Under a system of free and gratuitous coinage, the value of gold coin cannot normally be appreciably above or below the value of its gold content, because of the fact that coin

[1] *Essays,* 25.

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is readily convertible into bullion and bullion into coin. The same principle that determines the distribution of gold between the money use and the merchandise use[1] determines its distribution among the various particular uses under each of these headings, and among different countries, which, for our purpose, may be considered as merely different uses. Under a system of free and gratuitous coinage, with no impediments to the importation and exportation of gold, state boundary lines have, for the problem in question, no significance whatever.

The question is often asked whether changes in the monetary supply are causes or effects of changes in the general price level. Do general prices rise because the monetary supply increases or does the monetary supply increase because general prices rise? Hadley is undoubtedly right when he asserts that "changes in the quantity of money under this system [of free coinage] are *at once a cause and an effect* of changes in general price level."[2] Given, for example, a country with a certain monetary supply (MR), and a certain commodity supply (NE); an increase in the monetary supply will be followed by a rise in the general price level, the rise will destroy the equilibrium previously existing between the price levels at home and abroad, and between the monetary and merchandise values of gold, gold will tend to flow out of the circulation, seeking a better market in other countries or in the arts at home. Decrease the monetary supply, leaving the commodity supply unchanged, and prices will *per contra* fall until the higher value of money thereby expressed shall lead in like manner to an increase in the monetary supply and the establishment of a new equilibrium of prices. In these cases a change in

[1] Supra, 44–47.

[2] *Economics; an Account of the Relations between Private Property and Public Welfare*, 197–198.

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the monetary supply results in a change in the general price level, which in turn reacts upon the monetary supply. On the other hand, assume a condition of equilibrium, and increase the commodity supply, leaving the monetary supply unchanged; the increased commodity supply will cause a fall in the general price level, which will in turn lead to an increase in the monetary supply and the establishment of a new equilibrium of prices through the influx of new money from abroad, or from the mines or the arts at home, or through an increase in the rapidity of monetary circulation. Decrease the commodity supply leaving the monetary supply unchanged and the opposite results will follow. In these two latter cases a change in the commodity supply affects general prices and through them alters the monetary supply. In all the above suppositions a change in the monetary supply *relative* to the commodity supply is a condition *sine qua non* to any alteration in the general price level.[1]

The conclusion of this chapter therefore is, that the possession by primary money of a bullion value essentially the same as its money value in no way exempts it from the general principle of price determination found to apply to other forms of money. Primary money presents merely a particular case under the more general principle, and the bullion value of primary money affects the money value only by influencing the money supply or the commodity supply in harmony with the principle of price determination previously laid down and expressed in the formula $P=\frac{MR}{NE}$.

[1] Cf. supra, 43–47.

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CHAPTER VII

CONVERTIBLE PAPER AND CONVERTIBLE TOKEN MONEY

The principles underlying the determination of the values of inconvertible paper money and inconvertible token money have already been discussed.[1] One of the most important respects in which modern industrial societies differ from our hypothetical society is in the fact that large quantities of convertible paper[2] and token money circulate concurrently with primary money. The questions before us in this chapter are: To what extent does the fact of convertibility affect the value of such money? and in what manner does the addition of this factor require the principle of price determination so far developed to be modified?

It is important to observe at the outset that the fact of convertibility may have little or no effect upon the value of convertible money.[3] It has been found that inconvertible paper and inconvertible token money can circulate independently

[1] Supra, chaps. iv and v.

[2] As regards the subject of value here under consideration, it is immaterial whether the convertible paper is issued by a government which maintains a redemption fund and redeems its paper on demand, or is issued by banks under like circumstances. Bank notes are included under the term convertible paper money in this chapter. Cf. supra, 26–28, and Walker, *Discussions*, 200, 201.

[3] For convenience, the expression "convertible money" will be frequently used in this chapter to cover all forms of paper money and token money which are either directly or indirectly redeemable, by the authority issuing them, in primary money on demand. Convertible paper may be considered as convertible token money whose seigniorage is one hundred per cent. The differences between these two kinds of money are differences in non-essentials so far as the purposes of this chapter are concerned.

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of primary money. If such money is capable, by reason of its scarcity, of attaining a value above that of its material content, irrespective of any considerations of present or future convertibility, it may be made convertible into primary money, without the fact of its convertibility having any influence whatever upon its value. The convertibility of the rupee into gold at the present time probably exercises a very slight influence upon the value of that coin; it attained its 16d par before it was made convertible, and it is highly probable that if the Government of India should to-day exercise its option of refusing to give sovereigns for rupees, the refusal would have little or no effect upon the value of the rupee.[1] As long as the Indian Government will give a sovereign for fifteen rupees the rupee will not depreciate below 16d; it may, however, advance considerably above 16d, unless the government continues to stand ready to give rupees for sovereigns at the same rate; provided, of course, that such an advance is not prevented by the importation and circulation of sovereigns or other kinds of money.

Convertible money will possess the same value as the primary money with which it is interchangeable. A five dollar bill or five silver dollars will obtain for a person the same amount of goods as a five dollar gold piece. If a five dollar bill possessed a greater purchasing power over goods than a five dollar gold piece, people would exchange their gold pieces for bills and vice versa. An economic price, we have seen,[2] is the resultant of numerous subjective prices, and is dependent directly upon the subjective valuations

[1] The refusal might cause a temporary decline in the value of the rupee through its effect on public confidence, but unless there should be an important depression in business, the decline in the value of the rupee would be but temporary, if the government continued its policy of giving out rupees only in exchange for sovereigns at the rate of 15 rupees to the sovereign.

[2] Supra, 3–8.

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placed upon commodity and money respectively by the marginal pair. These valuations vary with the demand for the commodity relative to the supply. If convertible money is just as effective as primary money in creating this demand, it will have a like effect upon prices, so far as the commodity side of the price ratio is concerned.

The subjective values of commodities, however, are only one side of the price ratio. The subjective values of the money used are of equal importance. How does the substitution of convertible paper and token money for primary money affect these values? Convertible money finds its *raison d' être* largely in the fact that it economizes the precious metals, and makes possible a saving to the community. If paper money and token money are substituted for primary money, their substitution reduces the demand for the precious metals by the difference between the amount of metal in the primary money withdrawn from circulation and that used in the token money introduced plus that contained in the primary money required for the redemption fund. This economy of the precious metals results in an increased supply being thrown upon the market,[1] and, other things equal, in a decrease in their value.

Let us assume, for example, a country in which the circulating medium consists of $1,500,000,000 of United States gold coin. Suppose that there is a boom in business, and that in consequence an increase in the circulating medium becomes necessary; suppose that the additional amount of money required is $1,000,000,000; suppose, moreover, that it is known that a reserve of $500,000,000 of gold coin is sufficient to float $1,500,000,000 of convertible government

[1] This supply goes abroad and into the arts and increases the non-monetary wealth of the country by an equivalent amount; the goods obtained for the metal economized represent a net gain to the community.

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notes, and that this amount of coin is withdrawn from circulation, and constituted a reserve fund against which $1,500,000,000 of convertible government notes are circulated. What would be the effect upon prices? The business of the country has expanded, according to hypothesis, sixty-six and two-thirds per cent., the rapidity of monetary turnover has remained unchanged, and the circulating medium has increased from $1,500,000,000 to $2,500,000,000. The supply of money has simply kept pace with the demand. The amount of gold being consumed in the monetary use is the same as before. Yet on these suppositions the introduction of convertible paper is having a considerable effect upon prices. Had the paper not been introduced, an additional billion dollars of gold coin would have been necessary to maintain the previous price level. The new demand for gold would have increased its value, caused a new distribution of gold among different countries and between the monetary and merchandise uses, and lowered prices.

Continuing the illustration, let us suppose that an additional billion dollars of convertible notes are thrown into circulation, there being no further growth of business, and no further addition to the specie reserve, what would be the result? The new money would find its way into the banks and into the hands of various individuals, its marginal utility would fall, subjective prices would rise, and likewise the resultant economic prices. High prices and low discount rates would make the country a poor place to buy goods from or to invest capital in, and a good place to sell goods to and to obtain capital from. Imports would be increased and exports decreased. Exchange rates would advance to the gold-export point, and gold being a "relatively redundant" article, to use the excellent expression of Ricardo,[1] would go abroad and into the arts. Paper money could not

[1] *Letters to Malthus*, 10–14.

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be used either for exportation or for melting so that the overflow into both of these outlets would of necessity be an overflow of gold. The demand for gold for these purposes would give rise to heavy demands upon the redemption fund. As a result of the exportation of gold, the diminution of the redemption fund, and the consequent decline of business confidence, business would tend to become slack, gold would be hoarded, and still further demands would be made upon the redemption fund. If the movement were not checked before the redemption fund was exhausted, the paper money would depreciate, and we would have a régime of inconvertible paper money—a subject already considered;[1] if, on the other hand, the redemption fund should prove sufficient to meet all demands, the movement would in time automatically check itself. The stability of the redemption fund would increase public confidence, the decline in exports and the increase in imports would increase the demand for money at home and decrease it abroad, the outflow of gold would increase its value at home and decrease its value abroad, home prices would fall and foreign prices would rise, exports would increase and imports would decrease, exchange would fall to the gold import-point, and the tide of gold would turn and again flow homeward.

Only a small part of the gold which had gone abroad, however, would be destined to come back, for the convertible paper money introduced would have permanently displaced the greater part of it. Gold thus withdrawn from circulation and thrown upon the market is distributed between the merchandise use and the money use in the same manner and upon the same principles that the distribution of newly mined gold is effected.[2] In the distribution of that portion going into the money use among the different countries of the

[1] Supra, chap. iv.

[2] Supra, 43–48.

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world, the home country, of course, receives its due share. The final result of the introduction of the extra billion dollars of convertible paper money would be that a new and higher equilibrium of world prices would be attained, while a larger amount of gold would be absorbed in the merchandise uses.

Convertible paper and token money are assimilated in value to the primary money in which they are convertible. They take the place of primary money as a medium of exchange, and in their relation to prices are in no way different from primary money, save in the fact that they economize the precious metals and in so doing increase the amount of the circulating media, decrease the value of the money unit, and raise prices.

The fact of convertibility may or may not be an important element in creating the demand for convertible money. In either case it affects the value of convertible money only through influencing the money supply (MR) or the commodity supply (NE). Convertibility provides a mechanism through which the circulating medium is reduced when relatively redundant and increased when relatively scarce. It affects prices, however, only by working in harmony with the principle of price determination previously laid down, and expressed in the formula $P = \frac{MR}{NE}$.

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CHAPTER VIII

CREDIT INSTRUMENTS

Up to this point in the discussion we have been considering a hypothetical society in which the only medium of exchange was money.[1] It now becomes our task to complete the structure by taking into account the principal kinds of credit transactions. Here our hypothetical society becomes transformed into the actual business world of to-day.

The quantity theory is admitted to hold in a purely monetary régime by many who deny its applicability to a régime where exchanges are performed largely through the instrumentality of credit instruments. In fact, the use of credit instruments as media of exchange is generally considered the most vulnerable point at which to attack the quantity theory.

Credit refers to the exchange of present goods for future goods. To use the words of Jevons,[1] "I *take credit* when I induce my creditor to consent to my paying a month hence what might be demanded to-day; and I *give credit* when I allow my debtor in the same manner to put off the liquidation of his debt." These obligations may look forward to settlement in commodities, as, for example, the renting of a farm on shares, or to settlement in cash. In most cases the agreement calls for a money payment, and the debtor must stand ready to meet the obligation in money if money is demanded. Credit, generally speaking, to use the words of

[1] Cf. supra, 26–28.

[2] *Money*, etc., 238; cf. Kinley, *Money*, 199–202.

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Locke, is "nothing but the expectation of money within some limited time."[1]

For our purposes credit obligations may be classified under three heads: (1) where the obligation is in a form which is not negotiable, (2) where it is in the form of a negotiable instrument of postponed payment, (3) where it is in the form of a negotiable instrument payable in money on demand.

Typical of the first class of credit obligations are so-called book credits. A for example buys merchandise of B and "has it charged," promising to pay for it in thirty, sixty or ninety days, as the case may be.[2] The book entries are not contracts, but merely the creditor's records of contracts made either expressly or by implication. At the end of the specified credit period A pays B either in cash or by check. The transaction differs from an ordinary cash or check transaction only in the length of time intervening between the two parts of the operation—a difference of no significance so far as the subject under discussion is concerned. If it should happen that B in turn should buy merchandise of A, then the accounts would offset each other, and only the balance would have to be paid by money or check. It may sometimes happen that a number of accounts will be offset against each other in this way. A may owe B, B owe C, and C owe D; in that case, if the debts in each instance are for the same amount, an agreement may be made whereby A by paying D settles all the accounts; if the amounts are different they may be settled by merely the payment of balances. To the extent that accounts are offset one against another money or check payments are dispensed with, and the transactions become simply cases of barter—a subject already discussed.[3]

[1] *Works*, V. 148.

[2] Book accounts, especially in rural districts, it is well known, often have no fixed times of payment.

[3] Supra, 23–25.

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Two facts concerning book accounts require special consideration: (1) the case of bad debts, where the accounts are never settled, and (2) the case where the two parts of the transaction do not fall within the period of time taken as the unit for investigation. It is clear that in the former case commodities are transferred without creating any demand for a medium of exchange. Such exchanges, not being effected by means of the circulating medium, are not accounted for in the formula $P=\frac{MR}{NE}$. The case of bad debts is a special one, and, like gifts of money, and gifts of commodities, does not belong to the class of transactions contemplated by the quantity theory. The second fact requires a qualification of the theory of a kind common to all investigations where a fixed period of time is taken as a unit for investigation. The quantity theory, when applied to a régime marked off by fixed limits of time, presupposes that all transactions considered are begun and completed within that period.[1]

The second kind of credit is represented by credit instruments, which, for want of a better name, we may perhaps call "negotiable instruments of postponed payment." Like book credits, they do not liquidate debts but represent them.[2]

[1] With reference to the overlapping of credit periods, cf. Andrew, *Credit and the Value of Money*, in *Publics. Amer. Econ. Assoc.*, third series, VI., No. 1, 103–107 (February, 1905).

[2] "There is a fundamental difference, however, between the circulating forms of credit and those which for lack of a better name we may perhaps call 'fixed.' The former are real means of payment, the latter only means of postponing payment. While circulating credit takes the place of money, fixed credit only increases its use at a subsequent date, for bills, notes, and book entries all bring ultimately in their train a demand for real means of payment to complete the transactions which they have helped to initiate. Sooner or later they must be redeemed in means of final settlement." Andrew, ib., 103.

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Typical examples of this kind of credit are promissory notes and time bills of exchange. A, for example, buys merchandise of B, and gives him his promissory note payable in ninety days for the amount of the bill. B holds the note until maturity, at which time A pays the amount by cash or check. The note under such circumstances is not a means of payment but an instrument for the postponement of payment. Its influence on prices is the same as an ordinary book credit. If B, instead of holding the note until maturity, takes it to a bank and has it discounted, the bank becomes the payee of the note instead of B, while the discounting of the note amounts to nothing more nor less than a sale to the bank of the right to receive the principal of the note ninety days hence. If, on the other hand, B indorses the note to C, in payment for commodities purchased, and C indorses it to D, the note becomes a means of payment, and, to the extent that it is so transferred, acts upon prices by helping create a demand for goods and by effecting an economy in the use of other means of payment. Promissory notes, however, are not ordinarily passed from hand to hand by indorsement in this way, and such a use is not the reason for their existence. When so used they are more properly to be considered as commodities bartered than as media of exchange. The fact that instruments of postponed payment do not call for payment until after a fixed period of time, necessarily means that they involve an element of interest, whether they call for interest on their face or not, because in either case the present value of the instrument is the amount due at maturity discounted at the current rate of interest for the period the instrument has yet to run. If the instrument specifically calls for interest, the interest charge is imposed upon the payor; if it does not, the charge generally falls upon the original payee.

Bills of exchange and promissory notes are bought and

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sold like other commodities and their prices are determined by the same fundamental law of supply and demand.

"Interest-bearing documents," says Jevons,[1] ". . . are held in as large quantities as possible, because the longer they are held the more interest accrues. It is the principal business of every banker to hold a portfolio full of good bills, which really represent the investment of capital in industry. Government bonds, or bonds issued by public companies and corporations, do not differ from commercial bills except in the fact that they have very long, or even interminable, usance, and that the interest is paid at definite intervals. Such bonds represent the sinking of capital in fixed undertakings, and are therefore held as property by individual investors. They may be bought and sold for money, but are not money themselves. They rather necessitate than replace the use of money, since currency must have been paid at the first investment, and is repaid by degrees at the periodical terms fixed."

Negotiable instruments of postponed payment are considered throughout this monograph as commodities to be bought and sold, and not as media of exchange. Their prices are elements in the general price level, and vary inversely with the interest and discount rates.[2]

The third kind of credit, or that expressed in the form of negotiable instruments payable in money on demand, is the kind with which we are especially concerned here. Such instruments consist principally of checks, drafts, and bills of exchange payable at sight. A description of these documents here is unnecessary. Their characters are for our purposes essentially the same; a draft may be looked upon as a check drawn by one bank upon another, and a sight bill of exchange as a check drawn by one individual or corpora-

[1] *Money*, etc., 245, 246.
[2] Cf. infra, 86, 87.

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tion upon another, other than a bank. For convenience we will adopt the common practice and include them all under the term *checks*. They are all expressed in terms of money and require payment in money if the payee so demands. In large sums they are more conveniently handled than money; while the fact that only a small proportion of them are ever presented for redemption,—their amounts being generally merely transferred as debits and credits on the books of the banks,—gives them a remarkable power in economizing the use of money. A person can buy goods to the extent of his money and credit combined, and a credit demand is just as effective in determining the value of commodities as is a like money demand. The statement of Mill[1] is here apropos:

> . . . The amount of purchasing power which a person can exercise is composed of all the money in his possession or due to him, and all his credit. For exercising the whole of this power he finds a sufficient motive only under peculiar circumstances; but he always possesses it; and the portion of it which he at any time does exercise, is the measure of the effect which he produces on price. . . . Credit . . . has exactly the same purchasing power with money; and as money tells upon prices not simply in proportion to its amount, but to its amount multiplied by the number of times it changes hands, so also does credit; and credit transferable from hand to hand is in that proportion more potent, than credit which only performs one purchase.

On the other hand, every exchange performed by means of checks represents an economy in the use of money, and by lessening the demand for money affects the money side of the price ratio. The demand for commodities and the economy of money are, other things equal, proportionate to

[1] *Principles*, II. 66, 75.

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the amount of the checks multiplied by the rapidity of their respective circulations.[1]

The nature of the influence of checks upon prices is not essentially different from the influence of convertible government notes or bank notes.[2] Let us assume, for example, a country with a given amount of business, a given price level, a given rate of monetary circulation, and a circulating medium consisting solely of $2,500,000,000 of gold coin. Suppose that the government should withdraw from circulation $500,000,000 of this gold coin and make of it a gold reserve against which it should issue $1,500,000,000 of government notes, similar, for example, to the Dominion notes of Canada or to our own greenbacks. The notes would be secured by the reserve fund and by the government's credit. If the public had confidence in the government, the notes would circulate freely, prices would rise, exchange would turn against the country and, business remaining otherwise unchanged, an amount of gold slightly less than $1,000,000,000 would be exported from the country, or go into the arts, yielding in return an equivalent amount in foreign commodities and domestic gold products. This return would be a net gain to the community. The billion and a half dollars of government notes would circulate exactly on a par with the gold coin, and in being exchanged against commodities would affect their values in identically the same way. The effect upon prices would evidently be no different if it were a banking institution instead of the gov-

[1] This statement requires one qualification: there are some check transfers, as for example the cashing of checks and many transfers between banks and between banks and clearing houses, which do not effect the exchange of commodities, but rather owe their existence to the credit mechanism of exchange itself, of which they are an integral part. Cf. Cannon, *Clearing Houses, their History, Methods and Administration,* chaps. vi–ix.

[2] Cf. supra, chap. vii.

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ernment that established the reserve and issued the notes. Nor would the reason for the existence of the bank's credit any more than that for the existence of the government's credit affect the principle; the important consideration in either case would be that the public had confidence that the institution issuing the notes always could and always would maintain their parity with the gold. The effect upon prices would be no different if the bank, instead of issuing notes against this $500,000,000 reserve, should hold it as a reserve against deposits, which in turn gave rise to a deposit currency or check circulation (CR_c) equivalent to that represented by the circulation of the government notes in the previous illustration.

In view of the above facts it is clear that some change must be made in our statement of the principle of price determination to make it applicable to a régime in which business transactions are largely performed by means of credit instruments. Transactions performed through the instrumentality of checks are not accounted for in the formula $P = \frac{MR}{NE}$. Account must therefore be taken of these transactions, representing every day millions of dollars, performed by means of checks without the direct intervention of money at all.

If we isolate for the moment these check transactions from the monetary transactions previously considered, it is evident that the principle found to apply in the case of redeemable paper money will also apply here. Checks derive their value from the fact that they entitle their owners to receive an equivalent amount of cash. As in the case of money, it is self evident that the total value of commodities exchanged by means of checks is equal to the values of the different checks multiplied by their respective rapidities of circulation. If we designate the average price of commodities transferred by means of checks by P_c, the total amount of checks em-

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ployed in these transactions by C, the number of times C turns over by R_c, the number of commodities exchanged by means of checks by N_c, and their average number of exchanges by E_c; then by the same process of reasoning by which we derived the formula $P = \frac{MR}{NE}$ for monetary transactions,[1] we derive the formula $P_c = \frac{CR_c}{N_cE_c}$ for check transactions. If we designate the average price of all commodities sold for money and checks by P_s, then

$$P_s = \frac{MR + CR_c}{NE + N_cE_c}.$$

As in the case of money,[2] only those transactions are contemplated by the formula in which checks are exchanged for commodities (using that word in its most comprehensive sense). Gifts of checks, for example, exchanges of checks for checks, or exchanges of checks for cash are not included.[3]

The total circulating medium in a modern business com-

[1] Supra, 13–15.

[2] Cf. supra, 25.

[3] "Consider a community in which property is changing hands. Part of the total transfer, or flow, is not balanced by a reverse flow, but consists of gifts, bequests, charity, taxes, thefts, etc., but by far the larger part is *exchanged* for a return flow of equal value. Dividing property into three classes: money, bank deposits, and 'goods' (to include everything not in the first two classes), we may distinguish six sorts of exchanges, three within each class, viz.: goods against goods, or barter; deposits against deposits, as when a draft is purchased by a check; and money against money, as in 'changing' a bank-note; and three between classes: money against deposits, money against goods, and deposits against goods. In a complete theory all six should be included." Irving Fisher, *The Rôle of Capital in Economic Theory*, in *Econ. Jour.*, VII. 516 (December, 1897).

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munity is composed of money and checks[1] $(M + C)$, and the efficiency of the circulating medium is represented by the volume of each multiplied by its average rapidity of circulation $(MR + CR_c)$. If we put M_sR_s in place of $MR + CR_c$, and $P_sN_sE_s$ in place of $PNE + P_cN_cE_c$, the former[2] representing the total compound money-check circulating medium, and the latter the total demand for it in the form of commodities exchanged, then $P_s = \frac{M_sR_s}{N_sE_s}$.

The formula thus derived is quite different from the classical statement of the quantity theory. Whereas that statement is that a change in the monetary circulation, other things being equal, is accompanied by a proportionate rise or fall in general prices, our formula implies that a change in the total circulating medium, money and checks combined, is accompanied under like conditions by a proportionate variation in prices. These are two entirely different propositions. According to the latter proposition it is conceivable that prices may remain unaltered, and the demand for a circulating medium continue unchanged, although the monetary circulation is varying enormously; *provided* only that there is a reciprocal change in the check circulation; in other words, MR may vary indefinitely, N_sE_s remaining unchanged, without requiring any alteration in P_s, provided that CR_c varies in such a manner that $MR + CR_c$, or its equivalent, M_sR_s, remains constant.

Do modern conditions require then, as many contend, that the old quantity theory be modified, as in the above formula, to include under the term *money* checks as well as money

[1] For valuable mathematical discussions of the relation of credit instruments to the quantity theory, cf. Walras, *Theorie de la Monnaie*, chap. vii, and the above mentioned article by Irving Fisher, 516–521.

[2] Cf. supra, 13–16.

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proper, or is the classical theory still in its essentials applicable without such modification?

Only on one of two conditions would the formula $P_s = \frac{M_s R_s}{N_s E_s}$ be consistent with the classical form of the quantity theory. In the first place, check transactions may represent, as it were, a world apart from monetary transactions, and, creating neither a demand for money nor a supply of money, may have no direct influence on prices, affecting them only indirectly through their influence on the monetary supply (MR) in accordance with the principle of the quantity theory. In the second place, it may be that the check circulation (CR_c), other things equal, is a function of the monetary circulation, rising as it rises and falling as it falls.

The former hypothesis is the one defended by the late Francis A. Walker,[1] and briefly stated by him in these words:

> Let it be supposed that credits are no longer individual, . . . but that transference by indorsement has become general, and that banks have arisen which receive deposits of commercial paper representing a very large part of the wholesale transactions of the community. What shall be the effect of this upon the value of money? According to my way of thinking, so far as this transference of obligations, especially in the case of the bank, which thereby becomes creditor to many debtors and debtor to many creditors, results in the cancellation of indebtedness, as to an enormous extent it does, these transactions are, so far as concerns the use and by consequence the value of money, the same essentially as if they had been acts of barter. Exchanges of this category do not involve the employment of money, and they are therefore to be counted out when we are considering the causes and conditions which determine the value of money. They constitute no part of the demand for money.

[1] *Discussions*, I. 199, 200.

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Two transactions upon credit which in time and amount balance each other, and which, as a matter of fact, cancel each other when brought together in the bank, are, for our present purpose, equivalent to one transaction of the same amount in direct exchange or barter. The fact that each obligation has been expressed in terms of money, the fact that, in the buying and the selling which preceded the giving of the note of hand or bill of exchange, reference was had by both parties to prices determined by actual exchanges of goods for money,—these facts do not, it seems to me, at all impair the validity of the view that, so far as the use and the value of money are concerned, such transactions are, in essence, cases of barter.

The second hypothesis, which asserts that, other things equal, the circulation of checks is a function of the monetary circulation,[1] is the one I shall endeavor to defend. This hypothesis contemplates the same facts as does the above quotation from Walker. It differs from Walker's explanation, however, in recognizing a closer relation between money and checks than does the term barter, which he uses.

A bank is an institution the principal business of which is to loan its credit. Its profits come largely from the fact that in any particular period of time it is called upon to meet only a very small proportion of its obligations, and can therefore loan out at interest a large part of the funds intrusted to it by depositors. The right to receive money from the bank on demand, and the privilege of transferring that right to others by means of checks, are for most purposes as valuable to the depositor as the possession of the actual money. Inasmuch as money loaned out yields interest, while money in the tills does not, the bank's cash reserve is reduced to the lowest point consistent with safety. The proportion reserved to meet outstanding obligations varies

[1] Cf. Price, *On the Relation of Economic Science to Practical Affairs*, in *Journal of the Statistical Society*, LVIII. 605 (December, 1895).

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with the bank's location, the character of its trade, its reputation, the general financial condition of the community and so on. A bank must at all times maintain a sufficient reserve to meet all probable demands. A considerable margin of safety, moreover, is highly desirable; for failure promptly to meet its obligations means either a ruined reputation or bankruptcy. The result is that banks find it to their interest to keep on hand from day to day cash balances far in excess of the amounts they are actually called upon to pay out. These cash balances are necessary conditions to the millions of check transactions that take place every day. The amount of money continually tied up in bank reserves is withdrawn from the community's circulating medium, and accordingly lessens the supply of money available for cash transactions to the extent of the amount withdrawn multiplied by the rapidity of monetary turnover. These bank reserves, or cash balances, are the foundation upon which the vast superstructure of check transactions is built. Checks represent the right to demand money and must be paid in money if the payee so desires. We may call this credit superstructure, according to the ideas of Walker[1] and Laughlin,[2] "a case of highly refined barter," or we may call it "a highly efficient use of money"; the fact is none the less true that the foundation of it all is money.[3] It may render money

[1] Supra, 77, 78.

[2] *Principles*, chap. v.

[3] "Ever since men began to think about banking, some three hundred years ago, there has been a succession of writers who believed that the sound extension of banking credit was only limited by 'the value of marketable goods or property owned by borrowers.' . . . We hear today, as men heard in the days of John Law, or of Chamberlayne's Land Bank, or in the days of Assignats, or of the Restriction Act, that 'goods, not money, form the basis of credit operations' (Laughlin, p. 84); that 'any amount of credit may be created . . . without any relation to the quantity of money' (p. 85), and that the extension of credit is sound

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five, ten or a hundred times more efficient, but it still remains true that prices, however high or low they may be, are the value of commodities in terms of the value of the money unit. If we divide the money of the country into two parts; one, that used directly in daily cash transactions, and the other, that kept in banks as reserves, it may be said that, under perfectly static conditions, the proportion of the total represented by each of these parts would be constant. Each banker would find from experience what proportion of reserve to liabilities it was advisable for him to maintain, and would order his business, as far as possible, so that his reserve would neither exceed nor fall below that most desirable proportion. If it tended to exceed that proportion he would increase his loans, and, if necessary, reduce the rate of interest charged, or reduce the rate of interest paid on deposits; if it tended to fall below that proportion he would adopt opposite meas-

and normal 'so long as the claims held by the bank are based upon actual and saleable property'" (p. 93). . . .

"Credit in its various forms may, with the consent of the creditor, be exchanged for and cancelled by other credit or ordinary commodities, but it always purports to be payable in money, and if the creditor so desires, it must be actually so redeemed. It is preposterous then to assume that credit can be issued indefinitely upon the basis of goods without any regard whatever to the quantity of available money in which it is likely from time to time to be presented for redemption. . . . If the banks were to undertake to create either notes or deposits to the extent of the value of all goods and property in the country, bankruptcy would be the inevitable outcome, for the ensuing rise in prices and adverse balance of trade would instigate a demand for gold for export which would sweep every remnant of specie from their reserves. Bankers can no more lend their credit in the form of deposit accounts without regard to their cash reserves than they can in the form of notes. Either course involves disaster." Andrew, in *Publics. Amer. Econ. Assoc.*, third series, VI. No. 1, 109–110 (February, 1905).

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ures.[1] Additions to the money supply, under such circumstances, would, *caeteris paribus,* be distributed between bank reserves and other trade channels in the same proportions as was the original money supply. To use the language of our formula, an increase in M would, other things equal, result in a proportionate increase in bank reserves and through them of C.[2] If we suppose M to be doubled, then C would also be doubled, and the doubling of M + C would be accompanied by a doubling of P_s; provided, of course, that the terms R_s, N_s and E_s should remain unchanged.

Such static conditions, however, are never realized in the business world, and it is highly improbable that the amount of money circulating in a country could be doubled without materially and permanently affecting the commodity supply (N_sE_s), the rapidity of monetary and check circulation (R_s), the organization of banks, their methods of doing business, the character of their business, the proportion of reserves desirable to be held against liabilities, and so on. As business conditions change, no matter what the reason, or whether the changes are ephemeral or permanent; as the credit mechanism of exchange becomes more highly organized and extended in its operations or less so; as the laws of banking or the customs of bankers become altered; the proportion of the country's money which finds its way into bank reserves, as well as the proportions of reserves to liabilities which banks find it expedient to maintain, likewise

[1] The distribution of the money supply between its use as bank reserves and its use as a direct medium of exchange would be effected on the same principle as that by which the gold supply is distributed between the monetary use and the merchandise use of gold. Cf. supra, 43–47. Cf. Kinley, *Relation of the Credit System to the Value of Money,* in *Publics. Amer. Econ. Assoc.,* third series, VI. No. 1, 88–91, and *Money,* 215–219.

[2] Cf. Whitaker, *Ricardian Theory of Gold Movements,* etc., *in Quar. Jour. Econ.,* XVIII. 241–245 (February, 1904).

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change. Under such dynamic conditions it is needless to say that the check circulation does not vary *pari passu* with bank reserves, but only because the condition "other things equal" has not been realized. Andrew[1] recently gave an excellent statement of the situation when he said: "*In the long run, as apart from the cyclic oscillations, the quantity of banking credit is governed by the quantity of money, and each permanent addition to the monetary supply tends in the end towards an increase of credit. We are thus brought back to the traditional theorem . . . that the value of money in the long run depends most importantly upon its quantity. Its quantity affects prices not alone when money enters the circulation, but also when money is gathered in the bank reserves, because the amount of the only kind of credit which serves effectively as a substitute for money depends primarily upon the extent of these reserves.*"

In the proviso "other things being equal," which must be so strongly emphasized in every discussion of the quantity theory, one factor demands special emphasis, and so important is it, that if neglected, an inductive study of the problem will often lead to conclusions diametrically opposite to those which would be reached were the factor taken into account. The factor referred to is *business confidence*. Confidence is the corner-stone of every credit transaction. The delivery of a present good in return for a future good involves confidence that the debt will be paid. Every transaction in the credit world involves confidence. For example, I take a note to my banker, have it discounted, and have the proceeds placed to my credit; I then pay debts by means of checks drawn against the deposit so created. Here is one of the commonest of business transactions; observe, however, the amount of confidence it involves. I place confidence in the

[1] *Publics. Amer. Econ. Assoc.*, third series, VI. No. 1, 114 (February, 1905).

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person whose note I take to the bank to be discounted, the bank places confidence in the drawer of the note as well as in myself, the indorser; I place confidence in the bank when I trust it with my deposit, while the person to whom I pay my check placed confidence in me when he trusted me for my purchase, and places confidence in me and also in the bank when he accepts my check. If we should trace the check through several banks and clearing-houses, the amount of confidence found to be involved would be increased many fold. The relation between business confidence and credit transactions was well stated a generation and over ago by an anonymous writer in the *Biblical Repertory*:[1]

In short, credit is a state of mind, a belief. Mercantile credit is either a belief[2] in the ability of the party to whom it is extended, to fulfill the obligations into which he enters, or the power[2] of the latter to produce the entrusting of property to himself, on the ground of this faith. Involving a state of mind, it is subject to all those causes of fluctuation which influence the minds and control the beliefs of men. It is therefore as sensitive and volatile as the subtle causes which sway human belief. It is often affected by ignorance, error, and misapprehension. And in regard to the subject in hand, it has this peculiarity—not only that it propagates itself by that sympathetic and epidemic excitement which so largely sways communities of men, but intelligent persons, who see no ground of distrust, are compelled in their actions to follow the lead of the ignorant, who are seized with an unreasoning panic, and thus swell the current, which having opened a crevasse, deepens and widens it, until it has spread devastation far and near. . . . It is the desire to obtain the actual cash, in place of the promises

[1] *The Nature and Effects of Money; and of Credit as its Substitute*, in *Biblical Repertory*, XXXIV. 332 et seqq., 322.

[2] The word credit according to the first meaning here given is synonymous with business confidence, in its second meaning credit is dependent upon this business confidence.

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of it, which were previously trusted—a desire which grows in extent and urgency as it begins to be seen that the amount of promises current in the community vastly exceeds the ability to pay—that first creates a demand for money greatly beyond the actual supply. Hence, stringency, with threatening panic in the money market. Very soon the most solvent, and even wealthy men, who have pecuniary liabilities to meet, become anxious to obtain money in advance of the maturity of their debts, so as to be prepared for every possible emergency. Those to whom money is due, although they can, and in ordinary times would, extend their accommodations in the form of new loans, become timid and distrustful. They know not who is going to stand or fall. They desire to realize what is due them, and dare not trust it out again. Thus it is practically withdrawn from the money market; thus the stringency is increased by the very efforts to escape. They draw the fatal net about them in the very effort to relax it. The panic grows by what it feeds on. Everybody comes to distrust everybody. The strongest houses are suddenly unable to collect their dues, and, therefore, to meet their obligations. The result is a commercial crash, and widespread bankruptcy.

When business confidence is high there is a comparatively large cancellation of indebtedness, or offsetting of checks against checks, within individual banks by book entries, and among banks by the mechanism of the clearing-house; relatively little actual cash is demanded of the banks under such circumstances, and comparatively small bank reserves will support a large credit structure of deposit currency. When, on the other hand, business confidence is low, people withdraw their deposits from the banks, cash payments become more frequent, banks become more exacting in regard to securities, and much larger reserves are required to support with safety an even smaller credit structure. Business confidence, in a word, acts as a sort of a buffer between cash reserves and deposit currency. If business confidence in-

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creases, the check circulation will increase more rapidly than the monetary circulation or bank reserves;[1] if business confidence declines, an increase in the monetary circulation and in bank reserves may be accompanied by such a heavy decline in the use of checks that general prices will actually fall.

A rise in business confidence, it has been said, enables a given bank reserve to support a larger volume of deposit currency; if business does not at the same time grow sufficiently to absorb this increase in the circulating medium at the old level of prices, the value of the money unit will fall, prices will rise, importations will tend to be stimulated, and exportations to be discouraged, exchange will advance to the gold-export point, and gold, becoming a "relatively redundant" article, will be exported. The exportation of gold bars and the exportation and melting of gold coin will reduce prices in the home country through the diminution of the money supply, as well as through the contraction of deposit currency arising from the depressing influence of gold exportations upon business confidence.[2] If methods of banking improve, or if business confidence rises permanently to a higher level, a larger proportion of the country's transactions will be effected by means of checks. The outflow of gold into the arts and into foreign countries will increase the world's available supply of gold and diminish the value of gold. The increased supply will be distributed between the money uses and the merchandise uses in the manner already described,[3] and a new level of world prices will arise.

[1] Cf. infra, 144–146. Cf. also figures for volume of circulation, New York clearings, and price index numbers for the years 1874–1878, cited by Laughlin, which show a slight decline in the volume of circulation to have been accompanied by a decided decline in New York clearings and in price index numbers. *Principles*, 330.

[2] For a discussion of the effects of gold exportations upon business confidence, cf. Laveleye, *Commonplace Fallacies Concerning Money*, in *Contemporary Review*, XL. 790 et seqq. (November, 1881).

[3] Supra, 43–47.

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If business confidence falls the opposite phenomenon will take place, larger bank reserves will be required for a smaller volume of deposit currency, the proportion of cash transactions will increase, prices will fall, exportations will be stimulated, importations retarded, exchange will decline to the gold-import point, and gold, being a "relatively scarce" and highly valued commodity, will be imported from abroad, and perhaps mined in greater quantities at home, until prices rise to their normal level, by reason of the increase in the money supply and in the volume of deposit currency.[1] The importation of gold will have a buoyant effect upon business confidence.

The fact previously pointed out[2] that a rise or fall in general prices, due to alterations in the monetary supply relative to trade demands, does not require that the prices of all commodities shall rise or fall in the same proportion deserves renewed emphasis here. The general price level, being made up of the prices of all commodities exchanged for money or checks, varies with every alteration in the price of any one of them, unless that alteration is offset by reciprocal alterations in others. A change in the relative supply of money generally first makes itself felt in alterations in bank reserves, and through them tends to affect prices in something like the following order: prices of call paper,[3] prices of foreign and domestic bills, prices of securities,[4] prices of other time paper,[5] wholesale prices of produce and merchan-

[1] The importation or exportation of gold bars may lead to a considerable alteration in prices, by influencing the volume of deposit currency, through influencing business confidence; although the change in the volume of primary money may be very slight.

[2] Supra, 52–54.

[3] Cf. supra, 71.

[4] Cf. Conant, *Securities as a Means of Payment*, in *Annals of the American Academy of Political and Social Science*, XIV. 181 et seqq. (September, 1899).

[5] Cf. supra, 71.

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dise, prices of real estate, retail prices and finally wages. A permanent alteration in the monetary supply relative to trade demands is liable to make itself felt all along the line, although in varying degrees in the different classes of commodities enumerated. The effect of a temporary alteration in the relative monetary supply may be limited almost entirely to the prices of one or two of the kinds of commodities which at the particular time happen to be the more sensitive. There is reason to believe that such alterations in the relative money supply often extend no farther in their influence than to the prices of negotiable paper in the so-called money market itself. The order above given is by no means a hard and fast one. While the prices of securities, for example, generally respond quickly to alterations in the available supply of money, there are securities and securities, and some of them respond very slowly, sometimes real estate feels the effect quickly, and sometimes, as in the case of the Californian and Australian gold discoveries, local wages and retail prices are among the first commodities to respond.

Assuming a given state of credit development, and a fixed amount of business, the proportion of deposit currency to bank reserves is a function of business confidence; and, business confidence remaining the same, an increase in the monetary circulation is accompanied by a proportionate increase in bank reserves and in the deposit currency which they support; a decrease in the monetary circulation has the opposite effect. This being true, the quantity theory, in spite of all the complexities of the modern industrial régime, still holds true as a general principle; and general prices, *other things being equal,* vary proportionately and in the same direction with variations in the money supply.

In Book II it will be our task to test these conclusions by a statistical study.

[1] Cf. Whitaker, in *Quar. Jour. Econ.,* XVIII. 220–236 (Feb., 1904).

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MONEY AND CREDIT INSTRUMENTS

IN

THEIR RELATION TO GENERAL PRICES

BOOK II

THE PROBLEM—STATISTICAL

CHAPTER I

PRELIMINARY

It now becomes our task to test by the study of actual business conditions the validity of the conclusions arrived at in the previous book, that is, that, other things being equal, variations in the relative supply of the circulating media are accompanied by corresponding variations in the general price level, and that, under like conditions, the check circulation is a function of bank reserves, which in turn vary with the money supply;[1] or, in other words, that alterations

[1] In view of the fact that the operations of book II are sometimes worked on the basis of money in circulation exclusive of bank reserves and sometimes of money in circulation inclusive of bank reserves, it is to be noted, that under the static conditions assumed, the two items vary together and in the same proportions. The term M of the formula refers to the amount of money in circulation exclusive of bank reserves (cf. supra, 78–82). If we designate the amount of money in circulation inclusive of bank reserves by T, and the proportion of T represented by bank reserves by $\frac{T}{X}$ —a proportion found to be constant

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in $\frac{MR}{NE}$ are, *caeteris paribus,* accompanied by proportionate and corresponding alterations in $\frac{MR + CR_c}{NE + N_cE_c}$ and its equivalent, P_s.

In view of the complexity of the problem and the meagerness of the data it is realized that an inductive test of the validity of the quantity theory is a task beset with many difficulties. One may well have misgivings in undertaking such a task when so astute an economist as Marshall declares:[1]

> . . . I think that we have not the statistics, and that we shall not, in this generation, be able to get the statistics which would enable us to trace any statistical connection between the amount of the precious metals, or, as I would prefer to say, between the amount of currency and the average level of prices; because, supposing that the volume of the currency remains the same, the height of average prices may yet vary in consequence of several causes.

In a study of the type here undertaken, which attempts to measure numerically the relative movements of such factors in the problem as the monetary and check circulations, the amount of business done, business confidence, and general

under static conditions (cf. supra, 80, 81)—then it follows that variations in T are, *caeteris paribus,* accompanied by proportionate variation in $\frac{T}{X}$, and therefore in $(T - \frac{T}{X}$ or) M. If for example the total circulation is represented by 100 units, and the proportion held in the bank reserves is twenty-five per cent, then $T = 100$ and $M = 75$. If T were increased three fold, i. e. to 300, then $(T - \frac{T}{X}$ or) M would be increased in the same proportion and would be equal to 225.

[1] Evidence before the *Royal Commission Appointed to Inquire into the Recent Changes in the Relative Values of the Precious Metals,* Q. 9,629.

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prices, *very rough approximations* are all that can be expected. That such is all the following study pretends to give cannot be insisted upon too strongly. The "other things" that must be equal, in order that the proportionality of relation between the monetary circulation and general prices expressed by the quantity theory may be true, are altogether too numerous, too complex, and too closely interrelated to permit of anything like an exact quantitative formulation.

Furthermore, the conditions in no two countries are exactly alike, and a complete test of the theory would therefore require that it be tested by a study of conditions in every country of the world. Such a test, it is needless to say, is not contemplated here.

The inductive study which follows is limited to the United States; references, however, being occasionally made to other countries when considered helpful. The United States offers peculiar advantages for such a study; the field of investigation is large and varied; the amount of business carried on is probably greater than that of any other single country; the development of credit and banking has reached a higher degree of perfection than in any other country, with the possible exception of Great Britain; and lastly, the United States government has, through its Treasury Department, conducted several investigations affording valuable material upon the subject. If it should be found that the evidence for the United States points to the truth of the quantity theory under the highly specialized credit régime here prevailing, it would be at least presumptive evidence of its applicability in countries where money is more extensively used as a medium of exchange.

The remark just made regarding the limitation of this investigation to one country applies equally to its limitation to a given period of time. A study of this type to be of any

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value must cover the monetary demand as well as the monetary supply. Any test of the validity of the quantity theory consisting merely in a comparison of the amount of money in circulation with the general price level[1] is as worthless as would be a test of the power of a locomotive by a simple reference to its speed without taking into account the load it was carrying or the grade it was moving over. The same may be said of arguing for the truth or falsity of the quantity theory on the basis of a comparison of the price level with the world's output of gold from year to year, without taking into account the contemporaneous increase in the demand for gold both for money and for the arts.[2]

The study which follows covers the period from 1879 to 1904. The year 1879 has been taken as the starting point because much of the most valuable data relating to the problem are not available for an earlier period, and further, because 1879 was the year of the resumption of specie payments, and the problem is considerably simplified by being limited to a currency all parts of which are at par.

The fiscal years[3] 1883, 1884 and 1885 have been used

[1] Cf. for example Hardy, *The Quantity of Money and Prices, 1860–1891. An Inductive Study,* in *Jour. Pol. Econ.,* III. 145–168 (March, 1895).

[2] Cf. for example Laughlin, *Present Monetary Problems,* in *Popular Science Monthly,* LXVII. No. 3. 218, 219 (July, 1905). Cf. supra, 43–47.

[3] In the interpretation of the statistical tables contained in this monograph, it should be remembered that while the unit of time taken for computation is the fiscal year, the movements of the economic phenomena under investigation do not divide themselves into any such fixed annual divisions; that there is therefore a continual overlapping from year to year, that it requires time for interdependent economic forces to exert their influence, that events taking place near the end of one year may exert their influence almost entirely in the succeeding year, and that it is with the general movement of the various factors studied that we are especially concerned rather than with the more particular movements from year to year. Nevertheless the significance of the latter is by no means to be overlooked.

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throughout as the base years, the simple average for these three years having been taken in every case as one hundred in computing the index numbers.

For the sake of clearness the different factors in the problem will be considered in the following order: (1) The amount of the circulating medium ($M + C$), (2) the rapidity of turnover of the circulating medium (R and R_c), (3) the commodity supply ($NE + N_cE_c$), and finally the general price level (P_s). Our purpose will not be to compute numerically the absolute values of these various items, but rather to form some idea of their relative movements during the period from 1879 to 1904.

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CHAPTER II

THE AMOUNT OF MONEY IN CIRCULATION

The problem before us in this chapter is to estimate the relative amounts of money in circulation in the United States and the relative amounts held as bank reserves during each year of the period from 1879 to 1904.

The most reliable sources of information concerning the monetary circulation of the United States are the publications of the Treasury Department. These figures, however, are only rough approximations, as the method employed in their calculation will show. The first calculation, made in 1873, was a rough estimate and has been the basis of all calculations since. Secretary Gage,[1] in April, 1898, speaking of the method employed, said:

> . . . The estimates from year to year since 1873 have been arrived at by adding to the stock of coin at that date the annual coinage and the amount of domestic coin imported, deducting the loss by recoinage of United States coin, the amount exported, and estimated as used in the industrial arts.

Inaccurate as such figures must be, they are the best attainable. In view of the fact that we are concerned here more particularly with relative variations from year to year than with absolute amounts, it is probable that the inaccuracy of the figures will not, for our purposes, be as misleading as would at first appear.

The *Statistical Abstracts* of the United States give the total monetary circulation, inclusive of National bank notes, for July first of each year of the period under consideration.

[1] *Gold in Circulation*, in *Yale Review*, VII. 105 (May, 1898).

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The figures given refer to only one date in the year, however, and it is evident that the circulation on July first may or may not be typical of that for the year. There is no reason why July first, 1904, for example, should be any more representative of the average circulation for the fiscal year ending June 30, 1904, than should July first, 1903; inasmuch as the latter date represents the circulation at the beginning of the year, while the former represents it at the end of the year. A more representative figure for the year than that of either date separately would be the mean of the circulations for the two dates; and that is the basis of the figures for the amount of money in circulation each year given in the table at the close of this chapter.

Of the total money "in circulation" a considerable part, it has been said, is continuously withdrawn from the actual business of direct exchange, and in the form of bank reserves[1] performs the function of supporting the country's check circulation. The amount of money thus continuously tied up is not exchanged for commodities, and affects prices only indirectly by representing an actual demand for money, and by supporting the check circulation. As long as it is in the vaults of banks it performs no exchanges in the sense contemplated by the quantity theory, and, its rapidity of circulation being zero, it cancels out in the expression MR of the formula. As has already been observed,[2] Mill classed bank reserves among permanent hoards, and declared that they were not included in the money supply in the sense of that term contemplated by the quantity theory. Although the theory is no less true whether bank reserves are so included in the money supply or not, the principles of the theory can

[1] The term bank reserves as used throughout this paper refers to cash actually on hand and not to legal reserves as contemplated by the national bank act. Cf. infra, 98 note.

[2] Supra, 21.

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be more readily explained and their truth tested, if bank reserves are deducted from the circulating medium and treated as the foundation of the country's check circulation.[1]

The information available concerning the amounts of the country's money tied up in bank reserves from year to year during the period in question is not entirely satisfactory. Figures for the entire period showing the cash balances held by national banks on five typical days of each year are given in the 1904 annual report of the Comptroller of the Currency. An average of these figures for the five dates corresponding to each fiscal year affords a reasonably correct idea of the average amounts of money held by national banks during each year. The data available concerning banks other than national, however, are unfortunately not so complete and satisfactory. With reference to such banks, the Comptroller said in a recent report:[2]

. . . By law it is the duty of the Comptroller to obtain and publish in his annual report to Congress information respecting the condition of banks, banking institutions, and savings banks organized under authority of the States and Territories, the returns to be obtained from State officials having supervision thereof or from such other authentic sources as may be available. While provision is made by a majority of the States of the Union for supervision of incorporated banks and banking institutions, but few require reports from private banks and bankers or exercise any supervision thereover. It has been the custom of the Bureau for a number of years past to classify the returns from banks and banking institutions as follows: State banks (banks of discount and deposit), loan and trust companies, mutual savings institutions (those without capital stock), stock savings banks, and private banks. From a careful examination of the records it would appear that about 90 per cent. of the banks of the first two classes submit reports either

[1] Cf. supra, 89 note.

[2] *Report of the Comptroller of the Currency*, 1900, I. p. xxxviii.

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to State authorities or directly to this office. Of the mutual savings banks all report through official sources, except those located in the States of Delaware and Maryland. There seems to exist a disinclination on the part of private banks and bankers to furnish the Bureau information with respect to their condition, and as a result only about 20 to 25 per cent. respond favorably to requests for statements. The total returns indicate, however, that banks reporting represent practically 83 per cent. of the banking capital of the country.

From the above statement it would appear that the figures given by the Comptroller's reports are reasonably complete for all classes of banks except private banks. The Comptroller's report for 1904 shows that the reserves of the different classes of banks for that year were as follows:[1]

No. of Banks.	Character of Banks.	Reserves.
		(Millions.)
5,412	National Banks.[2]	690
6,923	State Banks.	211
585	Loan and Trust Companies.	61
1,157	Savings Banks.[3]	25
854	Private Banks.	6
14,931		993

If it should be assumed that three fourths of the private banks did not report, and that the non-reporting private banks held reserves proportionate to their number, as compared with the number of private banks reporting, then the

[1] *Report,* I. 9, 219, 421. Cf. supra, 95 note.

[2] Figures for September 6, 1904.

[3] Savings bank reserves should perhaps more properly be excluded from the country's bank reserves in a study of this character, since they do not normally serve to any extent as a basis for deposit currency. They are not separated by the Comptroller, however, from the reserves of other banks during the greater part of the period under consideration, and, inasmuch as they are comparatively small, the error involved in including them with the reserves of other banks should be unimportant.

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total reserves of all private banks in 1904 would have amounted to but twenty-four million dollars, or an amount equal to less than two and one half per cent. of the total reserves of all banks. In view of the comparative unimportance of the reserves of private banks, of the fact that we are concerned here with the relative increase or decrease of bank reserves from year to year rather than with their absolute amounts, and of the presumption that the proportion of the reserves of non-reporting banks to those of reporting banks would be fairly constant, it is probable that the figures as given by the Comptroller of the Currency will prove a reasonably satisfactory index of the growth of bank reserves, for the purposes of a study of the character here undertaken.

The following table of monetary circulation constitutes the conclusion of this chapter. Further comment upon the table will be deferred until the relative numerical values of the other factors in the price formula $\left(P_s = \frac{MR + CR_c}{NE + N_cE_c}\right)$ can be estimated.[1] In the next chapter an attempt will be made to estimate the relative growth of the country's check circulation, CR_c of the formula.

NOTE ON TABLE OF MONETARY CIRCULATION.

The figures for money in circulation for each year (column I) represent the mean between the circulation at the beginning of the fiscal year and the circulation at the end of the year (*Statistical Abstracts of the United States*, 1900, 1902 and 1904). The figures for the money reserves of national banks (column II) were computed by adding together the following items: (1) the average amount of "lawful money," inclusive of minor coins, held by national banks for the five dates of the respective fiscal years on which reports were made to the Comptroller (*Report of the Comptroller of the Currency* 1904, I. 214–219, 523–539), (2) the average amount of bills of other national banks held for the same dates (ib., 523–539), (3) the average amount of

[1] Cf. infra, chap. viii.

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MONETARY CIRCULATION.

Date. Year Ending June 30.	I. Money in Circulation.		II. Money Reserves Held by National Banks.		III. Estimated Money Reserves of Banks Other than National.	IV. Estimated Money Reserves of All Banks.		V. Money in Circulation, Exclusive of Bank Reserves.	
	Amount. 000,000	Index Figures.	Amount. 000,000	Index Figures.	Amount. 000,000	Amount. 000,000	Index Figures.	Amount. 000,000	Index Figures.
1879	$ 774	63	$151	64		$216	61	$ 558	63
1880	896	73	173	74		285	81	611	69
1881	1,044	84	201	86		295	84	749	85
1882	1,144	93	203	86		287	82	857	97
1883	1,202	97	204	87		321	91	881	100
1884	1,237	100	227	97		321	91	916	104
1885	1,268	103	275	117		414	118	854	97
1886	1,273	103	269	114		375	107	898	102
1887	1,285	104	267	114		433	123	852	96
1888	1,345	109	282	120	$161	443	126	902	102
1889	1,376	111	304	129	200	504	143	872	99
1890	1,405	114	293	125	185	478	136	927	105
1891	1,463	118	316	134	166	482	137	981	111
1892	1,549	125	362	154	198	560	159	989	112
1893	1,599	129	335	143	206	541	154	1,058	120
1894	1,629	132	439	187	229	668	190	961	109
1895	1,631	132	388	165	228	616	175	1,015	115
1896	1,554	126	360	153	169	529	150	1,025	116
1897	1,573	127	414	176	193	607	172	966	109
1898	1,739	141	455	193	195	650	185	1,089	123
1899	1,871	151	497	211	211	708	201	1,163	132
1900	1,980	160	507	215	221	728	207	1,252	142
1901	2,115	171	560	238	240	800	227	1,315	149
1902	2,212	179	570	242	251	821	233	1,391	157
1903	2,259	183	569	242	276	845	240	1,414	160
1904	2,393	194	580	246	302	882	251	1,511	171

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United States certificates for legal tender held by national banks in the fiscal years 1900 and 1901 for the dates of the reports to the Comptroller subsequent to March 14, 1900, when the act allowing these certificates to be counted as part of the lawful money reserve was repealed. The figures for estimated money reserves of banks other than national (column III) were taken from the same report (p. 424). The figures for the estimated money reserves of all banks (column IV) for the period 1879–1888 were taken from the Comptroller's report for 1904 (p. 442); those for the period 1888–1904 were computed by adding to the reserves of national banks (column II) the reserves of banks other than national (column III).

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CHAPTER III

CHECK CIRCULATION

The problem before us in this chapter is to estimate the relative proportions of check and cash payments in the business of the country for the period covered by our study. In the last chapter we found our data incomplete for estimating the amount of money in circulation; here, unfortunately, we shall find them much more so. Meager, however, as they are, they are better than none at all. There is considerable probability, moreover, that errors will be constant, or will even in some measure offset each other, and, inasmuch as our problem is one of proportions and not of absolute amounts, it is probable that errors arising from incompleteness of data will not so materially affect the general result as would at first appear.

As early as 1857 investigations were made in England to find the relative importance of cash and checks in business transactions. In that year the report of the banking house of Mr. Slater showed that the percentages in receipts and payments were: gold and silver coin, less than three per cent., credit instruments, ninety per cent., and Bank of England notes, seven per cent.[1]

In June, 1865, Sir John Lubbock[2] (later Lord Avebury) read a paper before the Royal Statistical Society in which he gave the following classification of £19,000,000 paid over the counters of his bank by London customers:

[1] *Report of the Secretary of the Treasury*, 1896, 456.

[2] *On the "Country Clearings,"* in *Jour. Stat. Soc.*, XXVIII. 361 et seqq. (September, 1865).

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Checks and bills	£18,395,000	[97 per cent.]
Bank notes	408,000	[2 per cent.]
Country notes	79,000	[.4 per cent.]
Coin	118,000	[.6 per cent.]
Total	£19,000,000	[100 per cent.]

These figures the author refers to as representing "fairly the proportion which the use of notes and coin bears in the commerce of London to that of cheques and bills."[1]

Since the time of the above estimates several investigations on the subject have been made in the United States, and it is these investigations which more especially concern us here. The figures have been gathered for the most part through the office of the Comptroller of the Currency. The report of the Secretary of the Treasury for 1896 contains a summary of all investigations made prior to that year. The table on the next page gives a condensed statement of all these investigations except that of 1894.[2]

The investigation of 1896 was much more extensive than those which had gone before. The character of the investigation is best described by David Kinley,[3] under whose supervision it was planned and made.

. . . The circular prepared by the writer and sent to the banking institutions of the country by the Comptroller of the Currency called for the deposits made on the settlement day nearest the first of July last [1896] by retail dealers, wholesale dealers, and all other depositors, respectively, in gold, silver, paper currency, and checks, drafts, etc. The checks and drafts

[1] Lubbock, 363. Cf. Jevons, *Money*, etc., 285–287.

[2] The results of the investigation for 1894 are not included in the table, because, being limited to the deposits of certain classes of retail dealers, they are not comparable with the figures of the other investigations.

[3] *Credit Instruments in Business Transactions*, in *Jour. Pol. Econ.*, V. 158 et seqq. (March, 1897).

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PER CENT OF MONEY AND OF CHECKS IN RECEIPTS OF NATIONAL BANKS IN UNITED STATES AT SPECIFIED DATES.[1]

Character of Receipts.	1871.	1881.		1890.		1892.
	52 National Banks. Per cent.	June 30. 1966 National Banks. Per cent.	Sept. 17. 2132 National Banks. Per cent.	July 1. 3364 National Banks. Per cent.	Sept 17. 3474 National Banks Per cent.	Sept. 15. 3473 National Banks. Per cent.
Gold		0.65	1.38	0.89	1.13	0.88
Silver		0.16	0.17	0.32	0.43	0.41
Paper		4.06	4.36	6.29	7.40	8.10
Clearing house certificates.....		3.36	2.24	1.04	0.74	0.81
Total money	12.30	8.23	8.15	8.54	9.70	10.20
Checks, drafts, etc.				44.90	51.58	46.79
Exchanges for clearing house..				46.06	38.68	42.83
Miscellaneous.....				.50	.04	0.18
Total substitutes..	87.7	91.77	91.85	91.46	90.30	89.80

were intended to include all forms of credit papers which are used in payment of claims. The circular also asked whether the proportion of checks in the day's deposits was an average one, and for an estimate of its variation from the average, if it were not representative; whether wages were *usually* paid by checks in the community where the bank is situated; and for a statement of the length of the wage period.

The circular was sent by the Comptroller to all the banking institutions of the country, including national banks, state and private banks, savings banks and loan and trust companies.

About 5,750 replies were received, but of this number only 5,530 could be used. A brief summary of the results of the investigation is given in the following table:

It is from figures such as these that we must estimate the relative proportions of checks and money in effective commercial use in this country. The tables show directly only the medium which passes in certain special relations, that is,

[1] *Report of the Secretary of the Treasury*, 1896, 458, 459. Cf. Fisher, *Money and Credit Paper in the Modern Market*, in *Jour. Pol. Econ.*, III. 393–398 (September, 1895).

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AMOUNTS AND PROPORTIONS OF MONEY AND CHECKS IN CERTAIN CLASSES OF BANK DEPOSITS FOR SETTLING DAY NEAREST JULY 1, 1896.

Class of Deposits.	National Banks (3474).	Other Banks (2056).	All Banks (5530).
	000	000	000
Total deposits	250,408	52,419	302,936
Total wholesale deposits	56,450	6,634	63,088
Amount of money in wholesale deposits	2,474	474	2,949
Amount of checks in wholesale deposits	53,976	6,160	60,140
Total retail deposits	20,814	5,720	26,537
Amount of money in retail deposits	6,678	1,853	8,531
Amount of checks in retail deposits	14,136	3,867	18,006
Total other deposits	169,511	35,457	205,027
Amount of money in other deposits	7,094	2,851	9,947
Amount of checks in other deposits	162,417	32,606	195,081
Percentage, money in total deposits	6.5	11.9	7.4
Percentage, checks in total deposits	93.4	88.1	92.5
Percentage, money in wholesale deposits	4.4	7.2	4.7
Percentage, checks in wholesale deposits	95.6	92.8	95.3
Percentage, money in retail deposits	32.1	32.4	32.3
Percentage, checks in retail deposits	67.9	67.6	67.4
Percentage, money in other deposits	4.1	8.1	4.7
Percentage, checks in other deposits	95.8	91.9	95.1

according to the investigation of 1896 in the deposits of all classes of banks by retail dealers, by wholesale dealers, and by all other persons; according to the investigation of 1894, in the deposits of certain classes of retail dealers; and according to the investigations of earlier years, in the total *receipts* over the bank counters. In order, therefore, to complete the picture it is necessary to make conjectural additions for those transactions which are not reflected in bank receipts. This procedure is at best a precarious one, and only the roughest sort of an approximation can be hoped for.

The table shows that of the different classes of deposits, the proportions which were in the form of credit instruments were as follows: for deposits of wholesale merchants 95.3 per cent., for deposits of retail merchants 67.4 per cent., and for deposits of all others 95.1 per cent. The per cent.

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for wholesale transactions Kinley believes to be representative for the country as a whole, and therefore to demand no modification. The per cent. for retail transactions he does not believe to be representative, the chief reasons being that:[1]

> . . . they include 'pay checks' which the merchants have cashed; credit paper received in the course of regular trade; some received in other than the course of regular business, such as rent, pension checks, interest coupons, funds held for other people or for organizations, etc.; and checks paying for purchases extending over the usual period of credit, . . . again, because *the total deposits for the country are greater than the probable expenditure in retail purchases for a day.*

Allowing for these sources of error Kinley concludes that 55 is substantially accurate as the percentage of retail transactions effected by credit instruments.[2]

The third class of depositors, the report[3] says, is "very miscellaneous in its make-up." It includes corporations and individuals not in business and all "those accounts which represent the great mass of speculative transactions in the country." The figures for the deposits of this class must be corrected for the error of double counting.

> . . . A check on one bank deposited by a retail dealer in his own bank is counted among retail deposits; when it is sent by the receiving bank to the one on which it is drawn it will not be counted again in these deposits, but will appear with the 'all others' class. The same is true of checks in the wholesale deposits. . . . In places without a clearing-house the checks drawn on banks other than those in which they are deposited are exchanged and credited at the home bank on the same day. In the aggregate receipts, therefore, they would all be counted twice.[4]

[1] *Jour. Pol. Econ.*, V. 165.
[2] *Jour. Pol. Econ.*, V. 167.
[3] *Report*, 483.
[4] Kinley, in *Jour. Pol. Econ.*, V. 162, 163.

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Allowing for discrepancies in the figures as reported, and weighting the different classes of deposits according to their respective importance, Kinley concludes that "75 per cent. is a fair estimate of the amount of business transactions of all kinds done with credit instruments."[1] This percentage he refers to as a "sure minimum" for credit instruments. For want of better evidence I shall accept this figure as representing the proportion of the country's commercial transactions effected by means of credit instruments during the twenty-six years covered by this study; in doing so, however, I wish to qualify my acceptance by the statement that I consider it a fair maximum rather than a "sure minimum."[2]

[1] Ib., 172; cf. also Kinley, *Money*, 44, 108–114.

[2] Kinley, in my opinion, underestimates in several respects evidence contained in the *Report* pointing to relatively large cash payments. For example, the conclusion of the *Report* with reference to the relative importance of cash and checks in wage payments is based on a table (p. 493) summarizing by states and territories the answers given by 3,600 odd banks to the question: "Is it customary in your community to pay wages by check?" The table gives the ratio of affirmative to negative answers for the whole country as 1.96 to 1. With reference to the table the *Report* says (p. 492): "The information obtained, of course, is only of a very general character, yet it serves to prove something of the influence which both have on the use of checks by the people at large." The inadequacy of the table as evidence on the subject will be seen when it is noted that the form of the question is misleading on account of the ambiguity of the word customary (which might be interpreted to mean either "a custom" or "the custom"), and that small states are given as much importance as large ones in the table. Oklahoma in the average for the whole country is given as much weight as New York. Kansas, Nebraska, Utah, Colorado, Wyoming, Oklahoma, New Mexico and Indian Territory show a ratio of replies in favor of checks of 56 to 8, while for the entire remainder of the Union the ratio was 40.35 to 41 in favor of cash; and for New York, Pennsylvania, Massachusetts, New Jersey, Connecticut, and Rhode Island the ratio was 1.43 to 6 in favor of cash.

Another instance of the apparent underestimation of cash payments is in connection with the inquiries made concerning the receipts of retail merchants. To test the assertion frequently made that bank

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receipts would naturally exaggerate the relative importance of check payments for business at large, the Comptroller in the investigation of 1894 attempted to obtain data directly from retail trades. Blanks were sent to various retail merchants in different parts of the country with the request that they be filled out so as to show the percentage of cash and checks in their total receipts for a given period. A summary of some of the replies is given in the *Report* of 1896 (pp. 479–482). The story told by these figures makes rather strongly against the conclusion as to the wide use of credit instruments in retail trade. In not a single instance does the proportion of credit instruments in these receipts come up to the average obtained for the retail trade of the country as a whole by the observation of bank deposits. The receipts in the stores cited in Iowa City were 14 per cent checks, and in Davenport, Iowa, 15 per cent checks; yet the *Report* says (p. 480) that the average percentage of checks in retail deposits in the 1896 investigation was for Iowa City, three banks, 74 per cent; for Davenport, six banks, 64 per cent; for all Iowa, 60.7 per cent. In view of the greater advantage of this method of finding the relative importance of checks and cash in retail trade, does not the Comptroller's *Report* pass over such facts as these altogether too lightly?

Another point deserving of mention is the fact that the returns for the 1896 investigation were to be made for the settling day nearest July first. Of all times the first of the month is the time when a large percentage of checks would naturally be found, and this is especially true of a date like July first, which marks the beginning of a new quarter, as well as of a new half year, and, for a number of concerns, the new fiscal year. The reply of the Comptroller's *Report* to this objection (pp. 481, 482) does not seem adequate.

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CHAPTER IV

RAPIDITY OF MONETARY CIRCULATION

The rapidity with which money circulates is just as important an element in the fixing of the price level as is the amount of money in circulation.[1] In the words of Walker,[2] the demand for money and the supply of money is each "a quantity of two dimensions," or, to use an illustration employed by an early writer: "The volume of water required to propel a given machinery is inversely as the swiftness of its current."

It is one thing to realize that the rate of monetary turnover is an important factor in the determination of the general price level; it is a far different thing to measure that rate numerically. In 1875 one of the ablest writers on monetary science of the last century said:[3]

> . . . I have never met with any attempt to determine in any country the average rapidity of circulation, nor have I been able to think of any means whatever of approaching the investigation of the question, except in the inverse way. If we knew the amount of exchanges effected, and the quantity of currency used, we might get by division the average number of times the currency is turned over; but . . . the data are quite wanting.

Twenty-five years later M. Pierre des Essars[4] said, speaking of the same subject: "Quant à la vitesse avec laquelle se meut cette masse de métal soit *in specie,* soit sous forme de

[1] Supra, 11–18.

[2] *Money, Trade,* etc., 40. Cf. Locke, *Works,* V. 22.

[3] Jevons, *Money,* etc., 336.

[4] *La Vitesse de la Circulation de la Monnaie,* in *Journal de la Société de Statistique de Paris,* XXXVI. 143 (April, 1895).

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billets, de transferts de crédits et de compensations, dans l'état actual de la statistique, nous n'en savons rien."

An inductive study of the relation existing between the circulating media and the general price level would be incomplete without some sort of an estimate of the rapidity of monetary turnover (R of the formula). In view of the great need of some estimate upon this subject, the following one made along the line suggested by Jevons is offered. The data upon which it is based are so uncertain that it makes no other claim than that of being "better than nothing."

Now that we have ascertained in a rough way the amount of money in circulation[1] and the proportions of the country's business performed by means of money and of checks,[2] our next task, following out the plan suggested by Jevons, will be to answer the question: What is the total annual amount of check transactions in the business of the country? There are many statements which tell with something like fullness the amounts of checks which annually pass through the clearing-houses of the country; but these returns do not show the actual amount of business transacted by means of checks.

The investigation of 1896 represents the deposits on the settling day nearest July first of that year, made at 5,530 banks out of a total of nearly 13,000 in the country at the time.[3] To obtain the total check transactions on the day in question it will be necessary to make some estimate of the deposits at those banks which did not reply to the Comptroller's circular of inquiry. The Comptroller's Report for 1896 seems singularly inadequate upon this point. It proposes to answer the question: "What allowance should be

[1] Supra, 99.
[2] Supra, 106.
[3] Supra, 102–104.

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made for deposits in banks from which no replies were received?"[1] In reality it answers the question only as regards the deposits of retail merchants. The report says that there were about 13,000 banks in the country in 1896, and of the replies received 5,530 were used, and that if banks of reserve cities were thrown out, there would be left 5,005. This is approximately 40 per cent. of the whole number of banks outside those cities.[2] Kinley, in a later estimate, says:[3]

. . . The number of banks in places of 12,000 inhabitants or less which complied with the request for information was 3,450. The average of their retail deposits was about $2,375. If we assume this amount for the average of the non-reporting banks we get for their total retail deposits on the date selected the sum of 17.8 million dollars. Adding this to the sum [of $26,537,000[4]] returned we have for the day's aggregate deposits of retail traders in the whole country, in round numbers, forty-four million dollars.

It has already been noted that no estimate is made in the Comptroller's Report for deposits, other than those of retail merchants, at banks which did not reply. If we assume that the total deposits at the non-replying banks bear the same proportion to those of the replying banks, that the estimated deposits of retail merchants at the non-replying banks bear to the actual deposits of retail merchants at the replying banks, we arrive at $506,000,000 in round numbers as the figure representing the total deposits of all banks for the settling day nearest July 1, 1896. The investigation of 1896 showed that of the total deposits reported, 92.5 per cent. were checks.[5] If we assume this same percentage to hold

[1] *Report*, 477.

[2] The *Report* (p. 477) erroneously asserts that 5,005 is approximately 60 per cent of the whole number of banks outside the reserve cities.

[3] *Jour. Pol. Econ.*, V. 164.

[4] Supra, 104.

[5] Supra, 104.

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for the total deposits as above estimated, we have in round numbers $468,000,000 as the total amount of checks deposited on the day in question. Assuming this to be a typical day[1] for the year 1896, and allowing 305 days to the year, we arrive at $143,000,000,000 as the total check deposits for the year.

Willard Fisher some years ago estimated the total bank receipts of checks for the year 1891 by two different methods;[2] the one being a computation "from the amount of credit paper that does pass through the clearing-houses to the amount that is probably received by clearing-house banks and all others"; and the other being a computation of the receipts of all banks, based upon the receipts of national banks on the dates of the Comptroller's investigations of 1881, 1890 and 1892, previously referred to.[3] By the first method he arrived at $142,000,000,000[4] as the total of checks and drafts received by all banks in 1891, and by the second method at $158,976,000,000.[5] In conclusion, he says:[6]

. . . There is thus substantial agreement between the results reached by two independent methods. For a difference of $16,000,000,000, although no trifle in itself, is, when viewed as a

[1] The fact that the figures refer to the settling day nearest July 1 would tend to make them larger than normal (supra, 107 note), while the fact that July 1, 1896, was in the midst of a period of financial depression, and only a few days before the Chicago convention and the adoption of the free silver platform by the Democratic party, would tend to make the deposits of this period abnormally low. In the absence of better evidence we may perhaps be justified in making the gratuitous assumption that the tendencies in one direction offset those in the other, and that the figures for July 1, 1896, are, roughly speaking, typical for the year.

[2] *Jour. Pol. Econ.*, III. 400 et seqq. (September, 1895).

[3] Supra, 103.

[4] *Jour. Pol. Econ.*, III. 403.

[5] Ib., 404.

[6] Loc. cit.

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matter of ten per cent., not very alarming in so rough a computation as the present one. The average of the two amounts, then, or $150,000,000,000, may, in default of more reliable information, be taken as a fair approximation to the total of the credit operations through all the banks of the country.

When the rough character of these two estimates by Willard Fisher and of the one previously given in this paper is taken into account, together with the fact that they were made independently and upon entirely different bases,[1] it is noteworthy that the results should show such a close agreement.

While, as a rule, each check performs one transaction and is then deposited in a bank, it often happens that a check passes from hand to hand a number of times before being deposited, effecting an exchange of property at each transfer. This is especially true of certified checks which were so common a few years ago.[2] But, while considerations of this kind would probably make the check deposits in banks of the country appear to be considerably less than the amount of the actual business transactions performed through the instrumentality of checks during the same period, there are other considerations which tend to make bank deposits of checks larger than the business transactions they represent. In the case of the deposits of "all other classes" referred to in the Comptroller's investigation of 1896, it has been noted that there was considerable "double counting" of deposits.[3] Moreover, as previously observed,[4] banks receive and transfer many checks the sole function of whose receipt

[1] It will be noted that Fisher's computations refer to the year 1891, while the one made in this paper refers to the year 1896.

[2] Cf. Dunbar, *Theory and History of Banking*, 65 note, and Willis, *Credit Devices and the Quantity Theory*, in *Jour. Pol. Econ.*, IV. 303 (June, 1896).

[3] Supra, 106.

[4] Supra, 73 note.

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and transfer is to facilitate exchanges among banks, or between banks and clearing-houses—transfers which in no other way represent commercial transactions. Such transfers are part of the country's banking machinery, and their *raison d' être* is found in the credit mechanism of exchange itself.[1] These considerations, some making in one direction and some in another, are all of them incalculable, and in lieu of better evidence we shall make a gratuitous assumption of unverifiable accuracy, that they balance each other,[2] and that the bank deposits of checks as above[3] estimated represent a rough approximation to the actual check circulation for the year in question; in other words, that the expression CR_c of

[1] Cf. Cannon, *Clearing Houses*, chaps. vi–ix.

[2] "The amount of check receipts at the banks may be much greater in a year than the amount of the check exchanges in the business of the country. Suppose that a debtor draws a check upon his bank in Duluth, and sends it to a creditor in Watertown, Massachusetts. The check may be deposited in the Watertown bank, may thence pass to the Boston correspondent, thence to New York, thence to Chicago, thence to Duluth, and may thus appear five times as an item of the banks' receipts. Yet it may have effected only a single exchange of goods. In so far, then, as credit instruments experience such vicissitudes, it is necessary to reduce the total of credit paper in order to get the total of credit exchanges. But on the other hand it must be noted that a single check may very well serve more than once as a medium of exchange, and in so far as this occurs, the amount of the credit instruments passed may fall short of the amount of credit exchanges. . . . It is only when a check is given to a creditor who, instead of putting it in at a bank, endorses it, and passes it on to another person, that it makes necessary any addition to our conjectural total, and although there are, of course, no inconsiderable number of cases in which just that does happen, the number cannot be vast relatively to the total number of checks drawn. I know of no broad experiment from which one may, even in the roughest way, compute the amounts of the addition and the subtraction here mentioned, but it may be a fair guess that the two would balance each other." Willard Fisher, in *Jour. Pol. Econ.*, III. 404, 405.

[3] Supra, 111.

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the formula is equal to $143,000,000,000 for the year 1896, and that R_c is equal to one.

If we accept the figure $143,000,000,000 as representing the total check transactions for the year 1896, and 75 per cent. as the proportion of the total transactions of the country performed by means of checks, then the total trasactions of the country for the year 1896 amounted to $190,700,000,000, and the transactions performed by means of money to $47,700,000,000. A reference to the table of monetary circulation[1] will show that the total amount of money in circulation in 1896 was $1,554,000,000, and the amount exclusive of bank reserves was $1,025,000,000. These figures would give 31 as the rate of monetary turnover for the total amount of money in circulation, and 47 as the rate for the amount in circulation exclusive of bank reserves.[2]

This does not mean that every piece of money outside of bank reserves changed hands forty-seven times during the year 1896. Some changed hands much oftener and some did not change hands at all; probably the smaller denominations of money circulated more rapidly than the larger denominations.[3] Nor must is be supposed that the rate is uniform from year to year, or even from week to week. Sometimes the turnover is brisk and sometimes it is slow.[4] In times of financial depression large amounts of money are hoarded,[5] thus tending to diminish the average rapidity of turnover of the monetary volume as a whole; on the other hand, when business is prosperous comparatively little money is permitted to lie idle, and the rate of turnover is faster. It

[1] Supra, 99.

[2] Cf. supra, 89 note, and 95, 96.

[3] Cf. Newcomb, *Political Economy*, 340, 341.

[4] Cf. Walker, *Money*, 63, 418, and Kinley, *Money*, 101, 151–158, 363.

[5] Note for example the large hoardings of gold in the panic of 1893–1894. Cf. chart of Relative Circulation and General Prices, infra, 148. Cf. Noyes, *Thirty Years of American Finance*, 190 et seqq.

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is well to note in this connection a fact which our later discussion will exemplify,[1] that is, that in bad times, when business confidence is low, credit operations are not carried on so freely, and an extra burden is therefore thrown upon the monetary circulation which tends to counteract the tendency to hoarding, and therefore to maintain, or perhaps even at times to increase, the normal rate of monetary turnover.

The only other investigation bearing directly upon the rapidity of monetary turnover is the one conducted at Yale University a few years ago and described by Irving Fisher.[2] The method employed was that of studying the rapidity with which money passed through the hands of certain individuals, on the ground that the rapidity of circulation for each individual would be represented by his total money expenditure during a unit of time divided by the average amount of money in his possession during the same period. If these rates were taken for a sufficient number of persons, and the velocities were "weighted according to the stock of money associated with each of these rates" we would be able to derive a general index figure for the rapidity of monetary circulation for society as a whole. "A hundred such returns among students at Yale University indicate an average velocity of forty-five times a year, making the average length of time a dollar rests in one man's hands about eight days."[3]

[1] Cf. figures for monetary and check circulation during panic years 1884–1885, and 1893–1894, columns I and IV, General Summary table, infra, 141.

[2] *The Rôle of Capital in Economic Theory*, in *Econ. Jour.*, VII. 520 (December, 1897).

[3] M. Pierre des Essars, in a valuable article in *La Journal de la Société de Statistique de Paris* XXXVI. 143–151 (April, 1895), discusses, under the title: *La Vitesse de la Circulation de la Monnaie*, the rapidity of turnover of bank deposits for various countries of the continent of Europe. The principle of his investigation is essentially the same as that above described by Irving Fisher, and that of the one followed in this paper. The plan adopted is to divide the total displace-

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The preceding estimate of $143,000,000,000 as the total check circulation (CR_c) of the country, refers only to the year 1896. It now becomes necessary to estimate the annual check circulation for the twenty-six years covered by our study. Such an estimate must be indirect; there are no direct data upon the subject.

It seems reasonable to believe that the total check circulation would be in a rough way a function of the total clear-

ment of capital passing through the banks of a country during a year by the average balance. Designating the totality of deposits made to the banks by M_1, the totality of payments which the banks effect, by M, the average balance, by S, and its annual displacement, by V, he arrives at the formula:

$$VS = \frac{M + M_1}{2} \text{ or } V = \frac{M + M_1}{2S}$$

Applying the formula, M. Essars computes the rapidity of turnover of bank deposits for the principal banks of continental Europe. Unfortunately data for such an investigation are unavailable for the banks of England and the United States.

The figures for the rates of turnover of the bank deposits of certain European countries as computed by M. Essars are as follows:

Year.	Bank of France.	Bank of Germany.	Bank of Belgium.
1884	110	170	112
1885	107	165	102
1886	98	138	96
1887	115	128	112
1888	125	135	123
1889	113	157	153
1890	135	190	146
1891	138	170	141
1892	116	148	130
1893	120	165	118
1894	127	161	129

It is to be noted that bank deposits would naturally turn over much more rapidly than the country's money supply, since they represent, for the most part, the working capital of active business men who appreciate the loss involved in leaving funds to lie idle.

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ings of the country. The Comptroller's Report for 1896 shows that the percentages of the check receipts of all national banks going through the clearing-houses on July 1, 1890, September 17, 1890, and September 15, 1892, were respectively 50.3, 42.8 and 47.7.

Experiments made June 30 and September 17, 1881, gave 78.64 per cent. and 87.75 per cent. respectively as the proportion of checks drawn on New York national banks which go through the clearing-houses. For July 1 and September 17, 1890, the figures were 72 per cent. and 65 per cent., and on September 15, 1892, the figure was 69 per cent. . . . For Chicago . . . the percentages for July 1, 1890, September, 17, 1890, and September 15, 1892 . . . were 57 per cent., 48 per cent., and 45 per cent.[1] respectively. The agreement among the percentages passing through the clearing-houses upon different dates for each of these places is not so close, perhaps, as one would expect. It is quite probable that a less variation would appear were the figures given for years rather than for days. Granting, however, that the proportion of the total checks that pass through the clearing-houses from day to day and from year to year is not perfectly constant, and that within recent years the proportion passing through the clearing-houses has probably somewhat increased, it still remains true that for a short period of years the evidence points to a rough degree of constancy, and that in the present state of our data bank clearings are probably the best criterion of check circulation available.

A reference to the table of Monetary and Check Circulation at the close of this chapter will show that the total clearings of the country in 1896 were fifty-four billion dollars. The total check circulation for that year we have estimated at one hundred and forty-three billion dollars, thus giving 38 per cent. as the proportion passing through the clearing-

[1] Willard Fisher, in *Jour. Pol. Econ.*, III. 401.

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houses in 1896. Willard Fisher, as we have previously noted, estimated by two different methods the total check transactions of the country for the year 1891.[1] His estimate by the one method would give 34.4 per cent. as the proportion passing through the clearing-houses, and by the other, 30.7 per cent., the average of the two being 32.5 per cent. Taking the mean between this average figure for 1891, and the 38 per cent. obtained for 1896, we arrive at 35 per cent., which, in the absence of better information, we will consider the proportion of the country's total check circulation (CR_c) which passed through the clearing-houses each year during the period from 1879 to 1904.

The following table is therefore based upon the assumption that the average annual rate of monetary turnover[2] during the twenty-six years from 1879 to 1904 was 47[3] and that 35 per cent. of the country's total check circulation passed through the clearing-houses each year of that period. The price formula $P_s = \frac{MR + CR_c}{NE + N_cE_c}$ would therefore read

$$P_s = 47 \frac{\left(\begin{array}{c}\text{Amount of money in circulation exclusive of bank reserves}\end{array}\right) + \frac{100}{35}\left(\begin{array}{c}\text{Bank clearings}\end{array}\right)}{NE + N_cE_c}$$

On this basis the figures in the table of Monetary and Check Circulation on page 120 have been computed.

[1] Supra, 111, 112.

[2] Supra, 114.

[3] This does not mean to imply that the rate of monetary turnover was the same during each of the 26 years in question, but that our only available data for an estimate of this factor is limited to a few scattered days, and that in lieu of further data the safest assumption at present seems to be, that the rate found to apply in 1896 is fairly representative for the entire period of our study.

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NOTE EXPLANATORY OF TABLE OF MONETARY AND CHECK CIRCULATION.

The figures for monetary circulation (column I) represent 47 times the amount of money in circulation each year exclusive of total bank reserves (cf. column IV, table of Monetary Circulation). The figures for bank clearings were computed for the respective fiscal years from quarterly and monthly figures given by the *Commercial and Financial Chronicle* and the *Monthly Summary of Commerce and Finance of the United States*. The clearings for New York stock exchange transactions were removed from the New York Clearing House, May 17, 1892, and since that time have been made through the New York Stock Exchange Clearing House. Unfortunately no satisfactory records of the amounts of these clearings are available. *The Commercial and Financial Chronicle* (LIV, 742. May 7, 1892) estimates that they amount on an average to two and one-half times the market value of the reported stock exchange sales. This estimate has been adopted in computing the country's clearings from 1879 to May 17, 1892. The clearings referred to in the table therefore do not include stock exchange clearings. The figures for Estimated Total Check Circulation (column III) are based upon the assumption that 35 per cent. of the country's check circulation passes through the clearing houses. The index figures for check circulation are therefore the same as those for clearings. The figures representing the Ratio of Bank Reserves to Total Check Circulation (column IV) are based on the figures contained in column III, and those contained in column IV of the table on Monetary Circulation. Column V is a combination of columns I and III. All index figures are computed on the basis of the average for the fiscal years 1883, 1884 and 1885 as 100.

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MONETARY AND CHECK CIRCULATION.

(Amounts in billions of dollars.)

Year Ending June 30.	I. Monetary Circulation. (*MR* of Formula.)		II. Clearings.		III. Estimated Total Check Circulation. (CR_o of Formula.)	IV Ratio of Bank Reserves to Total Check Circulation.		V. Estimated Monetary and Check Circulation. ($MR + CR_o$ of Formula.)	
	Amount.	Index Figures.	Amount.	Index Figures.	Amount.	Per cent.	Index Figures.	Amount.	Index Figures.
1879	26.2	63	23.9	71	68	.318	82	94	69
1880	28.7	69	33.1	98	95	.300	77	124	91
1881	35.2	85	35.9	106	103	.286	74	138	101
1882	40.3	97	41.5	123	119	.241	62	159	116
1883	41.4	100	41.0	122	117	.274	71	158	115
1884	43.1	104	34.0	101	97	.331	85	140	102
1885	40.1	97	25.9	77	74	.560	144	114	83
1886	42.2	102	30.9	91	88	.426	110	130	95
1887	40.0	96	38.5	114	110	.394	102	150	109
1888	42.4	102	39.8	118	114	.389	100	156	114
1889	41.0	99	43.2	128	123	.410	106	164	120
1890	43.6	105	48.7	145	139	.344	89	183	134
1891	46.1	111	48.9	145	140	.344	89	186	136
1892	46.5	112	50.0	149	143	.392	101	189	138
1893	49.7	120	62.3	185	178	.304	78	228	166
1894	45.2	109	45.4	135	130	.514	132	175	128
1895	47.7	115	48.8	145	139	.443	114	187	136
1896	48.2	116	53.6	159	153	.346	89	201	147
1897	45.4	109	50.7	150	145	.419	108	190	139
1898	51.2	123	65.2	194	186	.350	90	237	173
1899	54.7	132	84.2	250	240	.295	76	295	215
1900	58.8	142	88.9	264	254	.287	74	313	228
1901	61.8	149	107	318	306	.261	67	368	269
1902	65.4	157	112	333	320	.257	66	385	281
1903	66.5	160	118	351	337	.251	65	403	294
1904	71.0	171	102	303	291	.303	78	362	264

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CHAPTER V

BUSINESS CONFIDENCE

In Book I the influence of variations in business confidence upon the media of exchange was pointed out.[1] Our next task will be to attempt to measure in a rough way the fluctuations of this same business confidence during the period 1879 to 1904. While business confidence is too vague and intangible an entity to be susceptible of direct measurement, there are certain fairly definite and concrete ways in which it manifests itself. These can to a certain extent be measured, and through them some idea can be obtained of the fluctuations of business confidence itself.

Probably the best criterion of business confidence is to be found in the study of commercial failures. When times are good and business of all kinds is prospering there are comparatively few failures, and those as a rule are for small amounts; but let prospects of poor crops arise, international complications become imminent, an influential financial establishment become insolvent, prospects arise for government interference with the tariff, or with the currency; or let any one of a hundred other things happen which may serve as the signal for retrenchment and liquidation; and one of the first and surest manifestations of financial stringency is the failure of a number of concerns which have been carrying on business in a reckless way or without sufficient financial backing. Commercial failures are contagious.[2] They are both effect and cause of stringent conditions in the world of business and finance; and their number, together with the

[1] Supra, 82–86.

[2] Cf. supra, 83, 84.

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amount of liabilities involved, marks in a rough way the progress and decline of periods of business depression.

The *Monthly Summary of Commerce and Finance,* published by the Department of Commerce and Labor, gives by quarterly periods the number and average liabilities of commercial failures in the United States as computed by Dun's *Review.* On the basis of these figures I have computed for the fiscal years 1879 to 1904 the proportion of failures to the total number of concerns doing business,[1] and the average liabilities of the concerns failing. Inasmuch as the failure of a large concern has a much stronger influence in depressing business confidence than does the failure of a small one, a safer criterion of business confidence can be obtained by combining the index figures representing the proportion of failures to concerns in business with those representing the average liabilities of concerns failing, than by taking either one of these items separately. This has been done in the index figures of " Business Distrust " and of Business Confidence given in the table (columns VII and VIII) at the close of this chapter.

Supplementary criteria, concerning the movement of business confidence, in the form of certain statistics relating to the operations of the stock market, and relating to bank failures are included in the table. The figures concerning the volume of stock transactions require little explanation. It is a well known fact that as a rule speculative transactions are large when business confidence is high, and small when

[1] The figures given for the total number of concerns doing business are by calendar years. In computing the proportion of failures to the number of concerns in business it has therefore been necessary to assume that the number of concerns in business for the fiscal years is the same as for the corresponding calendar years. A reference to the tables quoted will show that the error involved in this assumption is probably insignificant. The variation in the number of concerns doing business from one half year to another is comparatively small.

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business confidence is low. Conclusions drawn from these figures, however, do not allow for the normal growth of stock speculation, and data, therefore, of this kind are not reliable evidence concerning the movement of business confidence for any considerable periods of time, although they are certainly of value as evidence of its movement from year to year. Just as it is true that the amount of stock transactions tends to vary with the rise or fall of business confidence, so it is likewise true that the prices of stocks as a rule advance when business confidence rises and decline when it falls. The figures for prices have an advantage over those for total transactions just referred to, in that they largely eliminate errors due to the normal increase of business on the stock market.

The last column in the table on Stock Market Data (column III) refers to the annual average call discount rates at the New York Stock Exchange. These rates have been included because of the common impression that they are a valuable index of the movements of business confidence; though it may well be questioned whether this evidence is of much value. Call rates, it is to be observed, vary with the demand and supply of ready money, and accordingly may be high either because the supply is small or the demand is large, or may be low either because the supply is large or the demand is small. A large demand for call money, however, sometimes is a sign of low confidence and represents liquidations, and sometimes is a sign of high confidence and represents good opportunities for new investments. A small supply of call money, on the other hand, sometimes is a sign of low confidence and represents a demand for increased bank reserves, or a scarcity of money for current business; or it may be a sign of high business confidence and good opportunities for investments either in the call market itself or in the time market. For these reasons the same rate for

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call discounts is often accompanied by diametrically opposite conditions of business confidence.

The movement of business confidence for the period of our study is shown by the following table of Business Confidence. Column VII of the table gives the index figures for the opposite of business confidence, or what, for want of a better name, we have called "business distrust." The index figures for business confidence (column VIII) are the exact reverse of those for business distrust. In the remainder of our discussion, the movement of business confidence is sometimes measured by the index figures for business confidence itself and sometimes by the reverse figures or those for business distrust, according to which of the two sets of figures is the more readily comparable with the movements being studied. It should therefore be borne in mind that the two sets of figures represent the same phenomenon viewed from opposite points.

Further comment upon the table will be deferred until the growth of business and the movement of prices shall have been measured. In the next chapter we will attempt to measure the growth of business or the expression $NE + N_cE_c$ of the formula.

NOTES EXPLANATORY OF TABLE OF BUSINESS CONFIDENCE.

The figures for the market values of reported sales on the New York Stock Exchange (column I) were computed from the quarterly and monthly figures given at the beginning of each calendar year by the *Commercial and Financial Chronicle*. The index figures for the prices of 28 leading stocks (column II) were obtained as follows: The average annual prices of the 28 stocks referred to in the table of the Industrial Commission's Report (XIX. 1102, 1103) were reduced to simple index figures, and the figures thus obtained were combined into a simple general average. The figures for discount rates for the period 1879–1901 (column III) were compiled by John R. Commons, and are quoted from the Industrial Commission's Report (XIX. 727). The figures for the period 1902–1904 represent an average of the mean

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weekly rates, and are based upon the tables given in the *Monthly Summary of Commerce and Finance of the United States.* The figures for commercial failures (columns V and VI) were computed for fiscal years from quarterly figures given in the *Monthly Summary of Commerce and Finance of the United States.* The index figures of business distrust are the simple averages of the corresponding annual indices for the proportion of concerns failing (column V), and the average liabilities of concerns failing (column VI). The index figures for business confidence are the simple inversion, or, speaking mathematically, the "mirrored reflection" of the index figures of business distrust (column VII). The index figures throughout the table are based upon the average for the years 1883, 1884 and 1885 as 100.

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BUSINESS CONFIDENCE.

Date. Year Ending June 30.	Stock Market Data.				Commercial Failures.							
	I. Market Value of Reported Sales on the New York Stock Exchange.		II. Index Figures for Prices of 28 Leading Stocks.	III. Average Annual Rate of Interest on Call Loans, New York.	IV. Concerns[1] Doing Business.	V. Concerns Failing.			VI. Average Liabilities.		VII. Index Figures of Business Distrust. Average of V and VI.	VIII. Index Figures of Business Confidence. Reverse of VII.
							Proportion Failing.					
	Amount 000,000	Index Figures.			Number 000	Number.	Percentages	Index Figures.	Amount.	Index Figures.		
1879	2,679	44	76	3.58	702	8,711	1.20	111	$18,749	105	108	92
1880	5,460	91	108	13.47	747	5,097	0.68	63	12,803	72	67	133
1881	8,783	146	127	4.80	782	5,104	0.65	60	14,467	81	70	130
1882	7,502	125	128	7.91	822	6,313	0.76	70	12,799	72	71	129
1883	6,663	111	121	5.90	864	7,778	0.90	83	15,062	85	84	116
1884	6,695	111	104	2.57	905	10,057	1.11	103	22,976	128	115	85
1885	4,665	77	79	2.24	920	11,462	1.24	115	15,414	88	101	99
1886	6,355	106	91	2.26	970	9,954	0.98	91	10,469	59	75	125
1887	5,271	88	108	5.04	994	9,590	0.96	89	12,445	70	79	121
1888	3,659	61	106	3.56	1,047	9,911	0.94	87	18,215	102	94	106
1889	4,048	67	108	2.78	1,051	11,093	1.05	97	10,956	61	79	121
1890	4,114	68	114	6.26	1,111	10,664	0.96	88	13,904	78	83	117
1891	3,529	58	105	4.78	1,143	11,596	1.00	93	18,709	105	99	101
1892	4,796	79	110	2.61	1,173	11,702	0.99	92	13,649	77	81	119
1893	5,049	84	111	4.41	1,193	11,252	0.94	87	19,609	110	98	102
1894	3,232	54	103	2.57	1,114	15,879	1.42	131	17,547	98	114	86
1895	3,321	55	90	1.34	1,209	13,534	1.12	104	12,829	72	88	112
1896	3,632	60	99	2.75	1,152	13,566	1.18	109	13,432	75	92	108
1897	3,745	56	91	3.27	1,059	14,883	1.39	129	14,709	83	106	94
1898	7,185	119	106	2.04	1,006	13,248	1.31	121	9,819	55	88	112
1899	12,162	202	122	3.03	1,148	10,321	0.90	83	10,201	57	70	130
1900	10,199	168	135	7.47	1,174	9,816	0.84	78	12,588	71	74	126
1901	18,165	303	152	3.30	1,219	11,201	0.92	85	10,138	57	71	129
1902	13,389	223		4.00	1,253	11,408	0.91	84	10,880	61	72	128
1903	13,937	232		4.20	1,281	11,078	0.86	80	11,184	63	71	129
1904	7,659	128		2.58	1,320	12,655	0.96	89	13,286	75	82	118

[1] Calendar years, cf. supra, 122 note.

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CHAPTER VI

THE GROWTH OF BUSINESS

So far in our statistical study we have limited ourselves almost entirely to estimates concerning the supply of the circulating media. We have estimated the amount of money in circulation (M),[1] the average rate of monetary turnover (R),[2] the amount of checks in circulation (C),[3] and the average rate of check turnover (R_c).[4] Another subject of equal importance in studying the relation between the media of exchange and general prices is the demand for the circulating media. In the formula

$$P_s = \frac{MR + CR_c}{[5]\ NE + N_cE_c}$$

the demand for the circulating media is represented by $P_s(NE + N_cE_c)$ or by the average general price into the total number of sales.[6] It is obviously impossible to calculate by any direct method the different members of the expression $P_s(NE + N_cE_c)$. Resort must therefore be had, as in the study of the movement of business confidence, to an indirect method of calculation. The subject of prices will be considered in the next chapter. Here we are concerned with those factors in the demand for money and checks represented by $NE + N_cE_c$, the number of sales effected.

[1] Supra, 99.
[2] Supra, 114.
[3] Supra, 120.
[4] Supra, 114.
[5] Supra, 75, 76.
[6] Supra, 25, 75.

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It is a commonplace observation that the different organs of industrial society are very sympathetic, and that a depression or stimulation of any important business makes itself felt throughout the entire business world. If, then, we can obtain reasonably correct data representing the state of particular representative industries from year to year, we ought to be able to draw from them conclusions of value concerning the growth of business in general.

A number of methods have been suggested for judging the relative demand for a circulating medium from year to year. The growth of population is often used as a criterion in rough estimates. Jevons speaks of the volume of foreign trade as the test commonly employed in his time, and adds that he believes "the best test of the progress of trade, both internal and external, is furnished by the output of coal, the mainspring of our wealth."[1] Other criteria sometimes used are the consumption of pig iron, and the gross earnings of railroads. The data of any single industry, however, are liable to be misleading on account of circumstances peculiar to that industry. Although prosperity in one line of industry as a rule has a salutary effect upon others, no one line, however important it may be, is a safe index to all. While the consumption of pig iron, for example, may in most periods be a good criterion of the growth and decline of business, it is well known that within recent years changed methods of production, and an unprecedented demand for iron products, have caused its consumption to increase at a rate much faster than the increase of the country's business as a whole. There can be no question, on the other hand, but that the business of the United States during the last decade has grown at a rate much more than commensurate with the growth of its consumption of the great majority of staple agricultural products.

[1] *Money*, etc., 310.

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To eliminate conditions peculiar to any one industry and afford a general view of the growth of business as a whole, there are combined in the following table on the Growth of Business, data representing the condition of fourteen different lines of commercial activity, in addition to figures representing the growth of population. The table, it will be observed, is divided into two parts. The first part is the more general in character, and consists of items which not only represent important lines of trade in themselves, but which, in addition, on account of their close connection with many special industries, reflect the condition of business as a whole. The second part is composed of data relating to important representative articles belonging to different kinds of productive enterprise. The consumption of wheat and corn are indices of agriculture; the consumption of wool and cotton of the textile industries; the consumption of pig iron and of bituminous coal of mining and of manufacturing industry in general; the New York Stock Exchange sales, of speculation. The General Index Figures of the Growth of Business are made up of the simple averages of all the other index figures of the table, and are intended, by eliminating the characteristics of growth peculiar to individual industries and by emphasizing the characteristics they have in common, to be a composite photograph, as it were, of the growth of business as a whole.

NOTE ON TABLE OF GROWTH OF BUSINESS.

The figures given in the table were for the most part taken from the United States *Statistical Abstracts*, 1898–1904. All figures, except those for population, and those for railroad freight carried and gross earnings of railroads from operations for the years prior to 1889, are for fiscal years. The figures for population represent the estimated population for June 1 of each year. The figures relating to railroads for the period 1879–1889 are for calendar years. The figures for railroad earnings and freight carried for the period 1891 to 1901 were taken from the *Fourteenth Annual Report of the Statistics of Rail-*

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THE GROWTH OF BUSINESS.

Date. Year Ending June 30.	Population (June 1).		Tonnage Entered and Cleared.		Exports and Imports of Merchandise.		Revenues of Post Office Department.		Gross Earnings from Operation of the Railroads of the United States.		Freight Carried by the Railroads of the United States.		Receipts of the Western Union Telegraph Company.		Consumption of Pig Iron.	
	Number. 000,000	Index Figures.	Tons. 000,000	Index Figures.	Value. 000,000	Index Figures.	Amount. 000,000	Index Figures.	Amount. 000,000	Index Figures.	Tons. 000,000	Index Figures.	Amount. 000,000	Index Figures.	Tons. 000	Index Figures.
1879	49	89	27	108	$1,156	81	$ 30	68	$ 526	67			11.0	58	2,385	50
1880	50	91	31	120	1,504	105	33	76	614	78			12.8	67	3,494	74
1881	51	93	31	124	1,545	108	37	84	702	89			14.4	76	4,246	89
1882	52	96	30	116	1,475	103	42	95	764	97	360	92	17.1	90	4,630	98
1883	54	98	27	106	1,547	109	46	104	817	104	400	102	19.5	103	5,051	107
1884	55	100	24	96	1,408	99	43	99	771	98	339	86	19.6	104	4,874	103
1885	56	102	25	98	1,320	93	43	97	765	97	437	111	17.7	93	4,245	92
1886	57	104	25	97	1,315	92	44	100	822	105	482	123	16.3	86	4,298	93
1887	59	106	27	107	1,409	99	49	112	931	119	552	141	17.2	91	6,094	129
1888	60	109	26	103	1,420	100	53	120	951	121	591	151	19.7	104	6,733	142
1889	61	111	27	106	1,488	104	56	128	965	123	540	138	20.8	110	6,653	138
1890	63	114	31	122	1,647	114	61	139	1,052	134	637	162	22.4	118	7,732	163
1891	64	116	31	122	1,729	121	66	151	1,097	140	676	172	23.0	122	9,271	196
1892	65	119	36	143	1,858	130	71	162	1,171	149	707	180	23.7	125	8,347	176
1893	66	121	34	132	1,714	120	76	173	1,221	156	745	190	25.0	132	9,200	195
1894	68	123	34	136	1,547	109	75	171	1,073	137	638	163	21.9	115	7,124	151
1895	69	126	34	133	1,540	108	77	176	1,075	137	697	178	22.2	117	6,649	141
1896	70	130	35	139	1,662	117	82	188	1,150	147	766	195	22.6	119	9,504	201
1897	72	130	40	157	1,816	127	83	188	1,122	143	742	189	22.6	119	8,476	179
1898	73	133	44	172	1,848	129	89	203	1,247	159	879	224	23.9	126	7,441	157
1899	74	135	44	174	1,924	135	95	216	1,314	168	960	245	24.0	126	11,497	243
1900	76	139	47	186	2,244	157	102	233	1,487	190	1,102	281	24.8	131	13,521	286
1901	78	141	50	196	2,311	162	112	254	1,589	203	1,089	278	26.4	139	13,573	288
1902	79	145	48	192	2,285	160	122	278	1,726	220	1,200	306	28.1	149	15,982	339
1903	80	146	50	196	2,446	172	134	306	1,902	243	1,304	333	29.2	154	18,857	400
1904	82	149	48	191	2,452	172	145	328					29.2	154	18,165	385

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Date. Year Ending June 30.	Bituminous Coal Retained for Consumption.		Consumption of Wheat.		Consumption of Corn.		Consumption of Domestic and Foreign Cotton.		Consumption of Domestic and Foreign Wool.		Consumption of Wines and Liquors.		Market Value of Reported Sales on the New York Stock Exchange.		General Index of the Growth of Business (Representing $NE + N_cE_c$ of Formula).
	Tons. 000,000	Index Figures.	Bushels. 000,000	Index Figures.	Bushels. 000,000	Index Figures.	Pounds. 000,000	Index Figures.	Pounds. 000,000	Index Figures.	Gallons. 000,000	Index Figures.	Amount. 000,000	Index Figures.	
1879	34	50	270	77	1,300	81	779	81	246	67	423	62	$ 2,679	44	70
1880	33	50	268	77	1,448	90	953	99	357	97	506	73	5,460	91	85
1881	39	57	312	90	1,624	101	1,011	105	290	79	539	78	8,783	146	94
1882	49	72	262	75	1,151	72	851	94	336	91	625	92	7,502	125	94
1883	61	90	356	102	1,575	98	1,118	116	357	97	656	96	6,663	111	103
1884	69	101	310	89	1,505	94	901	94	376	102	692	102	6,695	111	99
1885	74	109	380	109	1,743	108	855	89	375	102	689	101	4,665	77	99
1886	65	96	263	75	1,871	116	1,128	117	424	115	742	109	6,355	106	102
1887	67	99	303	87	1,624	101	991	103	392	106	821	121	5,271	88	107
1888	79	117	337	96	1,431	89	1,180	123	378	102	880	129	3,659	61	111
1889	91	135	327	94	1,917	119	1,063	111	388	105	895	132	4,048	67	115
1890	85	126	381	109	2,009	125	1,164	121	378	102	973	143	4,114	68	124
1891	99	146	293	84	1,458	91	1,429	149	411	111	1,098	162	3,529	58	129
1892	105	154	387	111	1,939	121	1,600	167	439	119	1,113	164	4,796	79	140
1893	113	166	324	93	1,581	98	1,184	123	471	128	1,208	178	5,049	84	139
1894	114	167	233	67	1,553	97	1,113	116	347	94	1,148	169	3,232	54	125
1895	105	155	316	91	1,184	74	1,568	163	509	138	1,142	168	3,321	55	131
1896	120	176	341	98	2,051	128	1,311	137	490	133	1,170	172	3,632	60	143
1897	122	179	283	81	2,105	131	1,344	140	601	163	1,181	174	3,745	56	144
1898	130	192	313	90	1,691	105	1,879	196	397	107	1,266	186	7,185	119	153
1899	147	216	452	130	1,747	109	2,071	216	335	91	1,249	184	12,162	202	173
1900	169	249	361	104	1,865	116	1,722	180	437	118	1,349	199	10,199	168	183
1901	186	274	306	88	1,924	120	2,014	210	402	109	1,390	205	18,165	303	198
1902	198	291	514	147	1,495	93	2,027	212	480	130	1,539	227	13,389	223	207
1903	231	339	467	134	2,447	152	1,980	207	461	125	1,606	237	13,937	232	225
1904	248	365	517	148	2,186	136	2,067	216	462	125	1,659	244	7,659	128	211

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ways; those for 1889 and 1890 were furnished me by the statistician of the Interstate Commerce Commission; those for 1902–1904 were taken from the *Statistical Abstract* for 1904. The figures for the market value of reported sales on the New York Stock Exchange were computed for the fiscal years from quarterly figures published in January of each year by the *Commercial and Financial Chronicle.* Index figures are all based upon an average of the figures for 1883, 1884 and 1885 as 100. The General Index of the Growth of Business is a simple average of the other index figures given in the table. It is intended to represent the relative movements of the factors included in the expression $NE + N_cE_c$ of the formula $P_s = \frac{MR + CR_c}{NE + N_cE_c}$.

A valuable check upon the figures given in the table is the data on the "Progress of the United States in its Material Industries" given in the *Monthly Summary of Commerce and Finance* for June, 1902, from which the following items are taken: The national bank deposits of the country were, in round numbers, $1,006,000,000 in 1880, $1,485,000,000 in 1890, and $2,624,000,000 in 1900; or, in terms of proportions, they stood at 100 in 1880, 147 in 1890, and 267 in 1900. The savings bank deposits in 1880 were, in round numbers, $819,000,000, in 1890, $1,525,000,000, and in 1900, $2,450,000,000; or, in terms of proportions, the figures stood in 1880, 100, in 1890, 186, and in 1900, 299. The estimated value of farm property in 1880 was $12,181,000,000, in 1890, $16,082,000,000, and in 1900, $20,514,000,000; or, in terms of proportions, 100 in 1880, 132 in 1890, and 168 in 1900. The estimated value of farm products was, in 1880, $2,213,000,000, in 1890, $2,460,000,000, and in 1900, $3,764,000,000; or, in terms of proportions, 100 in 1880, 111 in 1890, and 170 in 1900. The estimated value of manufactures in the United States was, in 1880, $5,370,000,000, in 1890, $9,372,000,000, and in 1900, $13,039,000,000; or, in terms of proportions, 100 in 1880, 175 in 1890, and 243 in 1900. The number of tons of American vessels built in 1880 was 157,410, in 1890, 294,122, and in 1900, 393,790; the proportions being 100 in 1880, 187 in 1890 and 250 in 1900. The number of newspapers and periodicals published in the United States in 1880 was 9,723, in 1890, 16,948, and in 1900, 20,806; the proportions being 100 in 1880, 174 in 1890, and 214 in 1900. The average of the proportions for the different dates are, 1880, 100; 1890, 159; and 1900, 230. A comparison of these figures with the index figures for the same period of the growth of business, in the table, shows a close agreement.

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CHAPTER VII

RELATIVE PRICES

The final term of the equation $P_s = \frac{MR + CR_c}{NE + N_cE_c}$ to be estimated is P_s. This term represents a simple unweighted average of the prices at which every commodity contemplated by the expression $NE + N_cE_c$ is exchanged.[1] If we designate the prices of all the different commodities exchanged by $p_1, p_2, p_3, p_4, \ldots p_x$; the number of each of these commodities respectively which is exchanged by $n_1, n_2, n_3, n_4, \ldots n_y$; and the number of exchanges each makes by $e_1, e_2, e_3, e_4, \ldots e_z$; then, it is evident, the demand for the circulating medium, aside from that represented by bank reserves, will be expressed by

$$p_1n_1e_1 + p_2n_2e_2 + p_3n_3e_3 + p_4n_4e_4 + \ldots p_xn_ye_z,$$

and that P_s will be the average of $p_1, p_2, p_3, p_4, \ldots p_x$. The same idea may be expressed in another way, using the words of Irving Fisher:

> If we are discussing the sense in which the level of prices is connected with the quantity of circulating medium, . . . we must include every price, wholesale and retail; we must include prices of all commodities, even land, securities, and human services, and we must weight these, not in proportion to the amounts consumed, but in proportion to the amounts exchanged for the circulating medium.[2]

To state the meaning of the term P_s is to show the impossibility of estimating directly its numerical value, and to

[1] Cf. supra, 75, 127.

[2] Review of Walsh, *The Measurement of Exchange-Value*, in *Yale Review*, XI. 111 (May, 1902).

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show that here, as in the two preceding chapters, an indirect method of estimation must be resorted to. The method employed will be that of studying the index numbers of the prices of as wide a range of commodities as possible.

In the following table of prices there is given, for purposes of comparison, the more important tables of American prices relating to the period under investigation. A comparison of the different series of index figures cited will show a substantial agreement in the movements of prices portrayed. The table of prices which seems most useful for our purposes is that prepared by John R. Commons and N. I. Stone.[1] This table is based upon the prices of sixty-six staple products, comprised under five groups: (1) live stock, (2) animal products, (3) agricultural products, (4) metals, minerals and lumber, and (5) manufactured products. The different articles are weighted according to the volume of their production. The average prices for 1879–1889 are taken as 100. The figures relate to fiscal years. This table, on account of the range of commodities included, the period of years covered, the method of weighting employed, and the basis upon which the percentages were estimated, is for our purposes the most useful one.

The only other prices for which usable data are obtainable are those for labor and for certain classes of securities. Figures relating to these items are included in the table. Retail prices vary so much in different communities that figures relating to them are of little value for our purposes. In general they follow wholesale prices, but being less sensitive lag tardily behind them.[2] No usable figures for relative prices of real estate are available.

[1] *Final Report of the United States Industrial Commission*, XIX. 29, 30, 1105–1114.

[2] Cf. *Retail Prices of Food*, 1890 to 1904, in *Bulletin of the Bureau of Labor*, July, 1905, 157–163, and Schwiedland, *Étude sur les Rapports Existant entre les Prix en Gros et en Détail*, in *Revue d'Économie Politique*, IV. 43–53 (1890).

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The general index figures of prices and wages given in the last column of the table are intended to represent in a rough way the relative movement of the general price level (P_s of the formula). They are weighted averages of the index figures for wholesale prices, wages, and prices of railroad stocks.

NOTE ON TABLE OF RELATIVE PRICES AND WAGES.

a. The index figures of wholesale prices (column I) quoted from the *Aldrich Senate Report* are sufficiently familiar to require no explanation. The weighted average given is that in which "all articles are weighted according to importance comprising 68.60 per cent of total expenditure." The table of wholesale prices for 90 articles (column II) is based upon the *Aldrich Senate Report* tables for the period prior to 1892, and upon the tables prepared by R. P. Falkner, supplementary to the *Aldrich Senate Report* tables, for the period 1892–1899 (*Bulletin Department of Labor*, No. 38, p. 123. January, 1902). Common's index figures (column III), upon which our conclusions concerning relative prices are mainly based, have already been explained (supra, 134). A detailed analysis of these figures will be found in the *Report of the Industrial Commission* (XIX. 29, 30, 1105–1114). The index figures in column III marked with the superscript [2] are based upon the indices for the corresponding years in column IV, and show the same percentage of increase or decrease each year as compared with the year preceding, as is shown by the corresponding indices of that column. The indices for the wholesale prices of 9 groups of commodities comprising 251 to 261 articles (column IV) are quoted from the *Bulletin of the Bureau of Labor* for March, 1905 (414–419; 537–549). The index figures for prices of railroad stocks (column V) were prepared by John R. Commons and N. I. Stone and are quoted from the *Report of the Industrial Commission* (XIX. 29).

b. The index figures for wages in 25 occupations (column VI), as well as those for 192 occupations (column VII) were prepared by the Department of Labor and are quoted from the *Report of the Industrial Commission* (XIX. 730). The index figures in column VI marked with the superscript [2] are based upon the corresponding indices of column VIII, and show the same percentage of increase or decrease each year, as compared with the year preceding, as is shown by the corresponding indices of that column. The figures for weekly earnings per employee in certain selected occupations (column VIII) were prepared by the Bureau of Labor, and are quoted from the *Bulletin of the Bureau of Labor* for July, 1905 (p. 17).

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c. The general index figures of prices and wages (column IX) were computed by combining in a weighted average the index figures for prices of wholesale commodities (column III), the index figures for the prices of railroad securities (column V) and the index figures for wages (column VI).

d. Carroll D. Wright estimated that in 1890 there were in the United States 15,000,000 laboring men receiving on an average about $400 a year, representing, therefore, an annual wage payment of $6,000,000,000 (*Practical Sociology, 227*). The market value of securities sold on the New York Stock Exchange and reported in the year 1890 was, in round numbers, $4,000,000,000 (cf. table of Business Confidence, supra, 126). *The Commercial and Financial Chronicle* (LIV. 792) estimated in May, 1892, that the stock exchange clearings amounted to two and one-half times the reported sales of securities. The purchase of securities is almost entirely effected by means of checks. Suppose we assume, therefore, that the total sales of securities in New York in 1890 amounted to $10,000,000,000, and that the total sales for the country at large for that year bore the same relation to those of New York that the total clearings of the country at large for the year bore to those of New York. On that assumption the total transactions of the country in securities in 1890 amounted to $15,600,000,000. The total business transactions of all kinds in the United States in 1890 we have estimated at $183,000,000,000 (supra, 120). These estimates would give about 3 per cent of the total for wages, and 8 per cent of the total for transactions in stocks and other securities. Bringing the index figures for wages (column VI), for wholesale prices (column III) and for the prices of stocks (column V) into conformity by reducing each to the basis of the average of the indices for 1883, 1884, and 1885 as 100, and weighting them in the proportion of 3 per cent for wages, 8 per cent for the prices of stocks, and the remaining 89 per cent for wholesale commodities, we arrive at the general index figures of prices and wages (column IX) upon which the conclusions in the following chapter are based.

e. In view of the fact that the table for prices of railroad stocks (column V) extends only to 1901, and that data for bringing it up to date are not available to me, it has been impossible to extend the index figures of prices and wages from 1902 to 1904. It is well known that the fiscal years 1902 and 1903 were years of pronounced speculative activity and of advancing stocks, and that in 1904 something of a reaction set in (cf. table of Business Confidence, supra, 126, column I). The evidence available goes to show that the prices of securities in general advanced in the fiscal years 1902 and 1903 but declined in 1904 in harmony with the prices of wholesale commodities (column III), but

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Date. Year Ending June 30.	I. Wholesale Prices, 223 Commodities. Aldrich Senate Report Tables. Prices for 1860=100. Simple Average.	I. Wholesale Prices, 223 Commodities. Aldrich Senate Report Tables. Prices for 1860=100. Weighted Average.	II Wholesale Prices, 90 Commodities. Aldrich and Falkner Tables. Prices for 1860=100.	III. Wholesale Prices, 66 Commodities. Commons Tables. Prices 1879–1889 = 100.	IV. Wholesale Prices, 9 Groups of Commodities, 251 to 261 in Number. Bureau of Labor Tables. Prices 1890–1899=100.	V. Prices, 28 Railroad Stocks. Commons Tables. Prices 1879–1889=100.	VI. Wages, 25 Occupations. Department of Labor Tables. Wages for 1891=100.	VII. Wages, 192 Occupations. Department of Labor Tables. Wages for 1891=100.	VIII. Weekly Earning per Employee. Certain Selected Occupations Bureau of Labor Figures. Earnings 1890–1899=100.	IX. Prices and Wages. Weighted Average. Average Indices 1883, 1884 and 1885=100.
1879	96.6	95.0	103.4	89		73	91.1			86
1880	106.9	104.9	115.4	107		98	91.9			105
1881	105.7	108.4	113.5	107		114	94.6			106
1882	108.5	109.1	119.0	120		116	96.2			118
1883	106.0	106.6	114.2	111		112	97.0			109
1884	99.4	102.6	105.2	102		97	97.8			100
1885	93.0	93.3	96.9	94		75	97.1			91
1886	91.9	93.4	95.8	90		89	97.1			89
1887	92.6	94.5	96.3	90		101	97.9			90
1888	94.2	96.2	98.2	93		98	98.5			92
1889	94.2	98.5	98.9	94		100	98.8			93
1890	92.3	93.7	96.3	90	112.9	105	99.3		101.0	90
1891	92.2	94.4	96.6	95	111.7	98	100	100	100.8	94
1892			92.4	90	106.1	102	100	100.3	101.3	90
1893			93.2	90	105.6	103	99.9	99.3	101.2	90
1894			86.1	82	96.1	87	98.0	98.1	97.7	82
1895			81.5	81	93.6	84	97.2	97.9	98.4	80
1896			81.5	77	90.4	88	96.6	97.9	99.5	77
1897			78.6	73	89.7	86	96.1	99.0	99.2	74
1898			80.4	79	93.4	99	95.6	98.8	99.9	80
1899			83.6	77	101.7	115	96.8[3]	101.5	101.2	80
1900				90	110.5	126	99.6[3]	103.4	104.1	92
1901				88	108.5	143	101.3[3]		105.9	92
1902				91.6[2]	112.9	[4]	104.4[3]		109.2	[4]
1903				92.2[2]	113.6	[4]	107.3[3]		112.3	[4]
1904				91.7[2]	113.0	[4]	107.2[3]		112.2	[4]

[1] For explanation of table and superscripts [2], [3] and [4], cf. note, pp. 135–137, par. *a*, *b*, and *f* to *g*, respectively.

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that the movements of the prices of securities were more decided than those of the prices of wholesale commodities.

f. The following figures based upon the prices of 111 to 115 railroad stocks, in 100 share lots, on the New York Stock Exchange, will throw some light upon this subject.

Year Ending December 31st.	Average of Highest Yearly Quotations.	Average of Lowest Yearly Quotations.	Mean of Average of Highest and Average of Lowest Yearly Quotations.
1901	93⅛	66⅞	80
1902	110⅞	81⅛	96
1903	101¾	66¼	84
1904	91⅝	63⅜	77½

g. In interpreting these figures it is important to note that they are for calendar years, while those upon which the table is based are for fiscal years. The decline in the prices of stocks in the calendar year 1903 was principally in the latter half of the year—the half year belonging to the fiscal year 1904. Of the 114 stocks upon which the above figures are based for the calendar year 1903 the highest 1903 quotation of every one but three was in the first half year, and the lowest 1903 quotation of every one but six was in the second half year. (Figures computed from tables given in the *Commercial and Financial Chronicle*, last weekly numbers for years 1902, 1903, 1904 and 1905.)

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CHAPTER VIII

CONCLUSION

The principal conclusions of Book I, the validity of which it has been the object of Book II to test statistically, may be briefly summarized as follows:

1. In a given state of banking development, and under static conditions of business confidence, a country's bank reserves will tend to increase or decrease *pari passu* with the increase or decrease of the money supply.[1]

2. Inasmuch as the check circulation (CR_c) rests upon the bank reserves for its support, and in a given state of banking development the proportion of reserves to check circulation varies inversely with the degree of business confidence existing in the country, therefore, other things being equal, and especially, business confidence remaining the same, the country's check circulation will be a function of its bank reserves.

3. A relative increase in the circulating media is accompanied by a corresponding and proportionate increase in general prices and a relative decrease in the circulating media, by a corresponding and proportionate decrease in general prices; or, in the language of the formula,

$$P_s = \frac{MR + CR_c}{NE + N_cE_c}.$$

4. The fourth conclusion is corollary to the other three and necessarily follows from them; that is, that other things being equal and business confidence remaining the same, an increase in the money supply is accompanied by a corre-

[1] Cf. supra, 78–82.

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sponding and proportionate increase in general prices, and a decrease in the money supply by a corresponding and proportionate decrease in general prices; or, in the language of the formula, the relative supply of the media of exchange $\frac{MR + CR_c}{NE + N_cE_c}$ representing the general price level P_s, is, *caeteris paribus,* a function of the total money supply, and therefore also of the money supply less bank reserves or M of the formula.[1]

In the preceding chapters of Book II an attempt has been made to estimate statistically the relative values of the different factors in the price equation; it now becomes our task to draw the lines of our statistical study together, and to inquire whether its results tend to substantiate or contradict the conclusions arrived at in the previous deductive study. In the following table there is summarized for convenience of reference the relative movements of the principal factors in the problem as computed in the preceding tables.[2]

The first question to ask is: What relation does our statistical study show to exist between the country's money supply and its bank reserves? Is there any evidence whatever that the two items tend to vary together? To answer these questions, chart II is submitted.

The chart is self-explanatory. It shows that the general movement of "the amount of money in circulation" and that of bank reserves were closely parallel during the entire period from 1879 to 1904. The only part of the period in which there is an important digression from the parallel movement is 1894 and 1895, which represents the years of

[1] Cf. supra, 89 note.

[2] Column IX represents the movement of monetary and check circulation, the amount of business done from year to year being taken as constant. The index figures were obtained by dividing the index figure for Total Monetary and Check Circulation each year (column VI) by that for the Growth of Business (column VIII).

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GENERAL SUMMARY.

Date. Year Ending June 30.	I. Money in Circulation Inclusive of Bank Reserves.[1]	II. Bank Reserves.	III. Money in Circulation Exclusive of Bank Reserves.[1] M of Formula.	IV. Check Circulation. CR_c of Formula.	V. Ratio of Bank Reserves to Check Circulation.[2]	VI. Monetary and Check Circulation. $MR + CR_c$ of Formula.	VII. Business Distrust.	VIII. Growth of Business, Representing $NE + N_cE_c$ of Formula.	IX. Relative Circulation, Representing $\frac{MR + CR_c}{NE + N_cE_c}$ of Formula.	X. General Prices, Representing P, of Formula.
	Index Nos.	Index Nos.	Index Nos.	Index Nos.	Index Nos.	Index Nos.	Index Nos.	Index Nos.	Index Nos.	Index Nos.
1879	63	61	63	71	82	69	108	70	99	86
1880	73	81	69	98	77	91	67	85	107	105
1881	84	84	85	106	74	101	70	94	107	106
1882	93	82	97	123	62	116	71	94	123	118
1883	97	91	100	122	71	115	84	103	112	109
1884	100	91	104	101	85	102	115	99	103	100
1885	103	118	97	77	144	83	101	99	84	91
1886	103	107	102	91	110	95	75	102	83	89
1887	104	123	96	114	102	109	79	107	102	90
1888	109	126	102	118	100	114	94	111	103	92
1889	111	143	99	128	106	120	79	115	104	93
1890	114	136	105	145	89	134	83	124	108	90
1891	118	137	111	145	89	136	99	129	105	94
1892	125	159	112	149	101	138	81	140	99	90
1893	129	154	120	185	78	166	98	139	119	90
1894	132	190	109	135	132	128	114	125	102	82
1895	132	175	115	145	114	136	88	131	104	80
1896	126	150	116	159	89	147	92	143	103	77
1897	127	172	109	150	108	139	106	144	96	74
1898	141	185	123	194	90	173	88	153	113	80
1899	151	201	132	250	76	215	70	173	124	80
1900	160	207	142	264	74	228	74	183	125	92
1901	171	227	149	318	67	269	71	198	136	92
1902	179	233	157	333	66	281	72	207	136	
1903	183	240	160	351	65	294	71	225	131	
1904	194	251	171	303	78	264	82	211	125	

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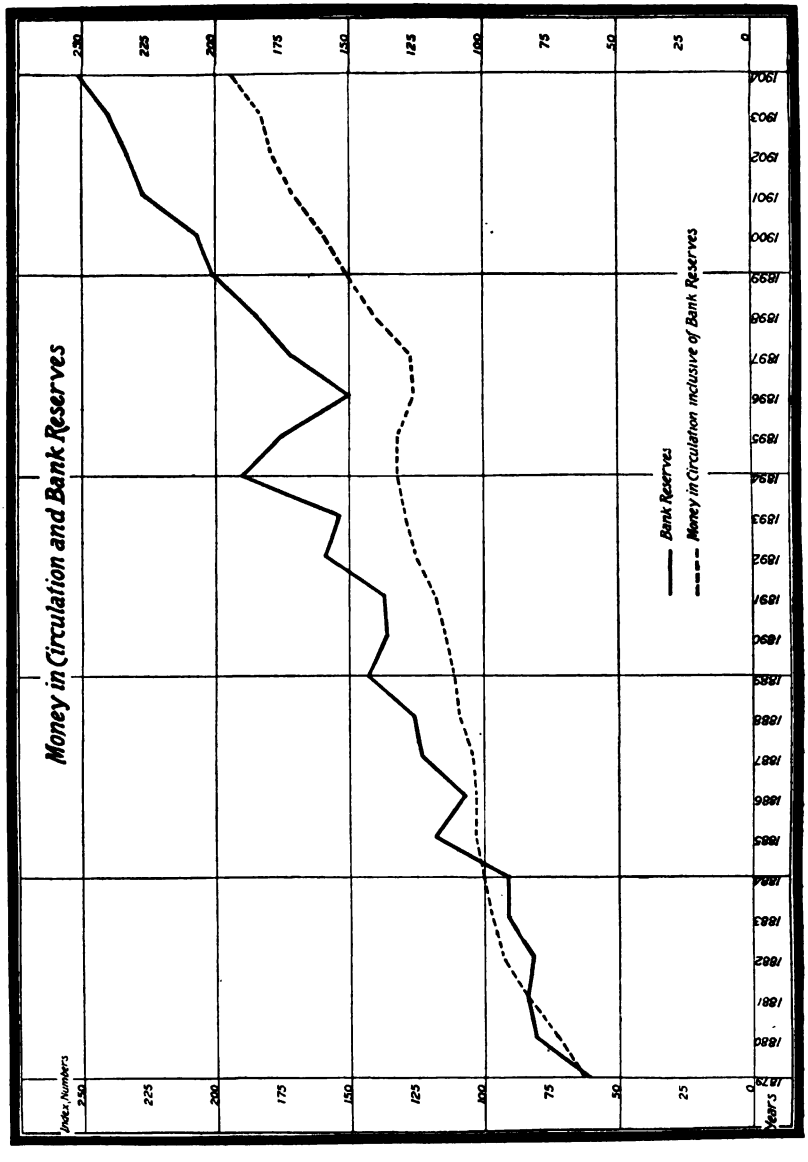

CHART II.

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the monetary panic, when business confidence was at a low ebb,[1] and when, according to our hypothesis, a relative increase in bank reserves[2] would be expected.[3] In three other years, 1885, 1889, and 1892 the chart shows minor digressions worthy of note. A reference to the table of Business Confidence[4] will show that each one of these years immediately followed a year of business depression.[5] Chart III will show that the increase of relative bank reserves from year to year during this period followed somewhat after the years of financial depression,[6] instead of being exactly contemporaneous with them. This would naturally be expected, since one of the first effects of a fall in business confidence is a drain on bank reserves,[7] and it requires time for banks to replenish their reserves and adjust themselves to strained financial conditions. There can be no question but that when due allowance is made for fluctuations in business confidence, the evidence of chart II strongly supports the contention that there exists a close relationship between the amount of money in circulation and the amount of the country's bank reserves.

[1] Supra, 126.

[2] Supra, 84–86.

[3] Cf. Noyes, 182–206, and Conant, *History of Modern Banks of Issue*, 504–553.

[4] Supra, 126.

[5] The panic of 1884 did not set in until about March, 1884, and it was in the last quarter of the fiscal year 1884 that its influence was principally exerted. The liabilities of commercial failures in the last quarter of the fiscal year 1884 amounted to $84,204,304, as compared with $40,186,978 for the quarter preceding and $56,627,821 for the quarter after. The depression of 1891 was likewise the more strongly felt in the later half of the year. Cf. supra, 92 note.

[6] Cf. infra, 144–146.

[7] Cf. Charts II and III on this point. Note fall in bank reserves in 1882, 1893 and 1896, and pronounced advances in the three years respectively succeeding.

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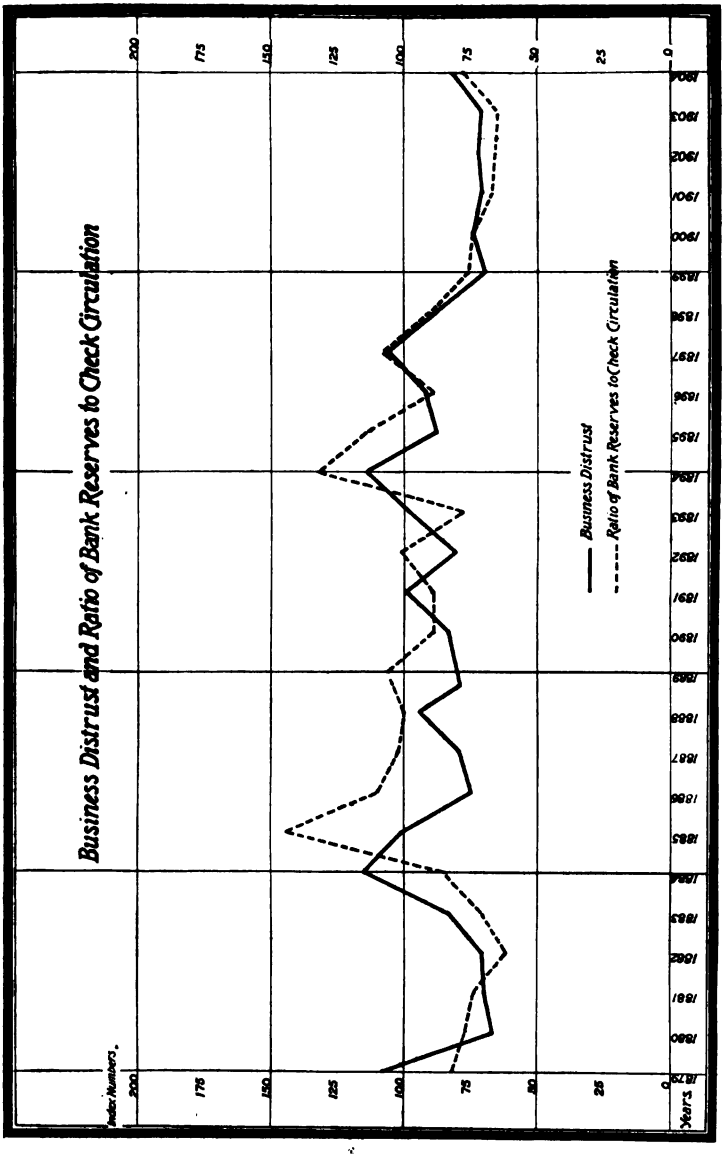
Business Distrust and Ratio of Bank Reserves to Check Circulation
Index Numbers.
Years
Business Distrust
Ratio of Bank Reserves to Check Circulation

CHART III.

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The next question to ask is: What does the evidence show to be the relation existing between the movement of business confidence[1] and the ratio of the country's bank reserves to its total check circulation? Is that ratio a function of business distrust and an inverse function of business confidence, as contended in Book I of this paper,[2] or does some other relation exist?

These questions are answered in chart III on Business Distrust and Ratio of Bank Reserves to Check Circulation. Again we see a striking parallelism between the two curves; the only important qualification being that just referred to in discussing chart II; that is, that for several years (notably from 1887 to 1893) the movement of the ratio of bank reserves to check circulation follows shortly after the corresponding movement of business distrust instead of being exactly contemporaneous.[4] If the movement of business distrust for each year of the period 1887 to 1893 is compared with the movement of the ratio of bank reserves to check circulation for the succeeding year, a very close parallelism will be observed. When the facts are remembered, that heavy demands are usually made upon bank reserves at the beginning of a period of depression and liquidation,[4] that it requires considerable time for banks to contract their loans and increase their reserves so as to meet the heavy demands which declining business confidence and increased commercial failures both foreshadow and cause, it is but natural that the results of a declining business confidence should frequently not be reflected in an increase of bank reserves until

[1] Cf. supra, 84–86.

[2] Supra, 87.

[3] A. C. Whitaker has recently pointed out a similar relation between the country's net gold shipments and its annual excess of merchandise exports or imports. *Quar. Jour. Econ.*, XVIII. 249–253 (February, 1904).

[4] Supra, 92 note (3).

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some time after it has spent its force in causing commercial failures. In fact it is not until the worst part of a period of depression is well over and a favorable reaction has set in that we would expect a material increase in bank reserves. Such an increase in reserves would in itself have a buoyant effect upon business confidence. As business confidence increases again, on the other hand, time is required for banks to extend their loans, and to reduce their reserves to normal proportions.

The fact previously mentioned[1] should be repeated here, that the unit of investigation in this study is the fiscal year, but that the movements being studied do not divide themselves naturally into yearly periods, and that there is therefore a continual overlapping process to be taken into account. A decline in business confidence taking place in the latter part of the fiscal year like that of 1884 or that of 1893, would not be expected to make its influence fully felt until well along in the succeeding year;[2] on the other hand a decline in business confidence like that of the fiscal year 1897, or an advance like that of 1898, taking place at the beginning of the year,[3] would normally spend its influence largely in the same year.

When proper allowance is made for the time required for alterations in business confidence to exert their influence on bank reserves, it will be seen that chart III shows a striking correspondence between the movements of the curve of Business Distrust and those of that of the Ratio of Bank Reserves to Check Circulation. That the chart substantiates the contention of Book I[4] to the effect that the ratio of

[1] Supra, 92 note.

[2] Cf. Noyes, 97 et seqq., 188–206.

[3] Cf. liabilities of commercial failures for the different quarters of these two years. *Monthly Summary of Commerce and Finance*, August, 1905, 664.

[4] Supra, 83–87.

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check circulation to bank reserves is a function of business confidence, there would seem to be little question.

The final link in the chain of our argument is found in the answer to the question: What is the testimony of our statistical study as to the relation existing between the relative circulation and the general price level? Does the price level rise as the relative circulation increases and fall as it decreases, or is the contention of Laughlin true that the "qauntity theory does not explain the facts," and that "taking the available data at hand for the United States, one would have no hesitation in saying that in no single case examined has there been any proporţion whatever between the movements of prices and the quantity of the circulation?"[1] In answer to this question chart IV on the Relative Circulation and General Prices is submitted.

This chart,[2] like the two preceding ones, tells its own story. One could hardly expect a more closely parallel movement of two complex economic factors functioning together than that shown by this chart. The general movement of the two curves taken as a whole is the same, while the individual variations from year to year exhibit a striking similarity. The only variations from the parallel movement worthy of notice in a rough statistical study of the type here undertaken are the two minor ones of 1887 and 1899, and the somewhat more important one of 1893. A reference to the years 1887 and 1899 in the general table of prices[3] will show that all of the individual tables of prices cited for those two years, except the Commons tables, exhibit advances in prices in both years. The sudden advance in the relative circulation in 1893 unaccompanied by an appreciable change

[1] *Principles*, 327 et seqq.

[2] For comment on the movement of prices for the years 1902–1904, cf. supra, 136, 137 note, paragraphs (*e*), (*f*) and (*g*).

[3] Supra, 138.

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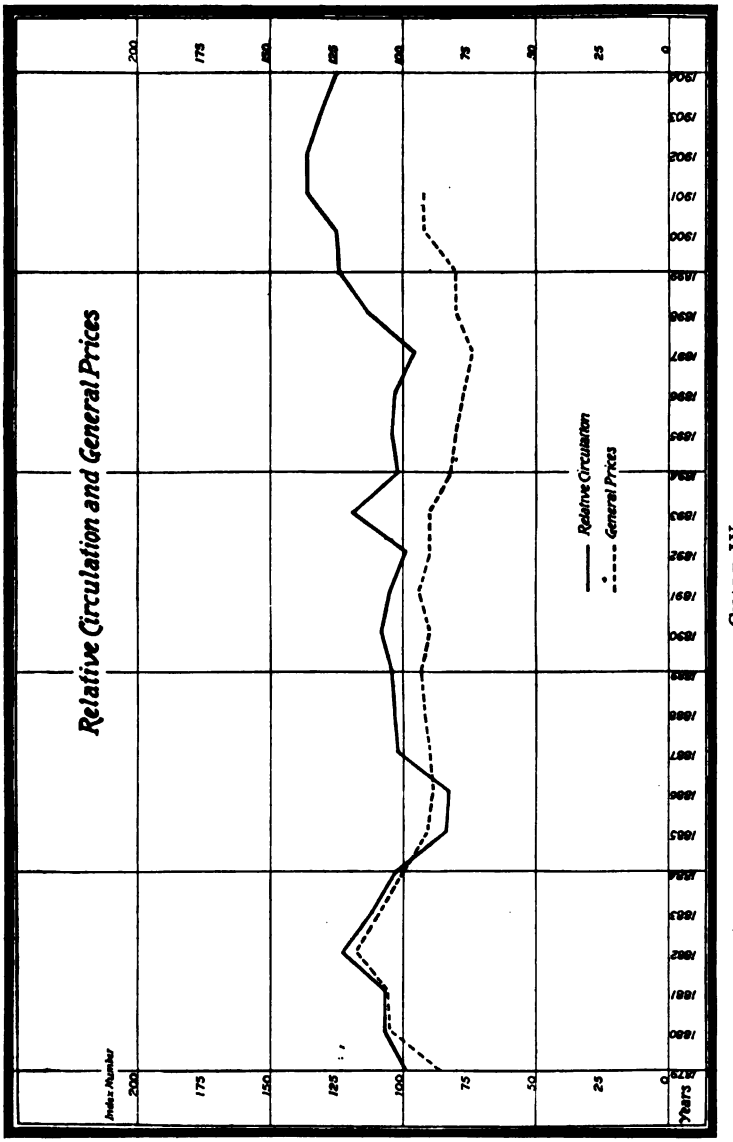

CHART IV.

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in prices is to be explained by the heavy hoardings of gold which characterized the monetary panic of that period.

This completes our study. The inductive investigation of Book II has been found to substantiate the conclusions arrived at deductively in Book I. We therefore conclude that the value of money is determined, like the value of other commodities, by the fundamental law of demand and supply, but that *caeteris paribus,* a change in economic prices can only find expression, and therefore only take place, through proportionate changes in the relative monetary supply; furthermore, that inasmuch as the check circulation is a function of bank reserves, which are in turn a function of the monetary supply, the extensive use of checks in our modern industrial régime does not alter the essential truth of the old quantity theory as that theory was held by the fathers of political economy and is still held by the majority of its students.

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